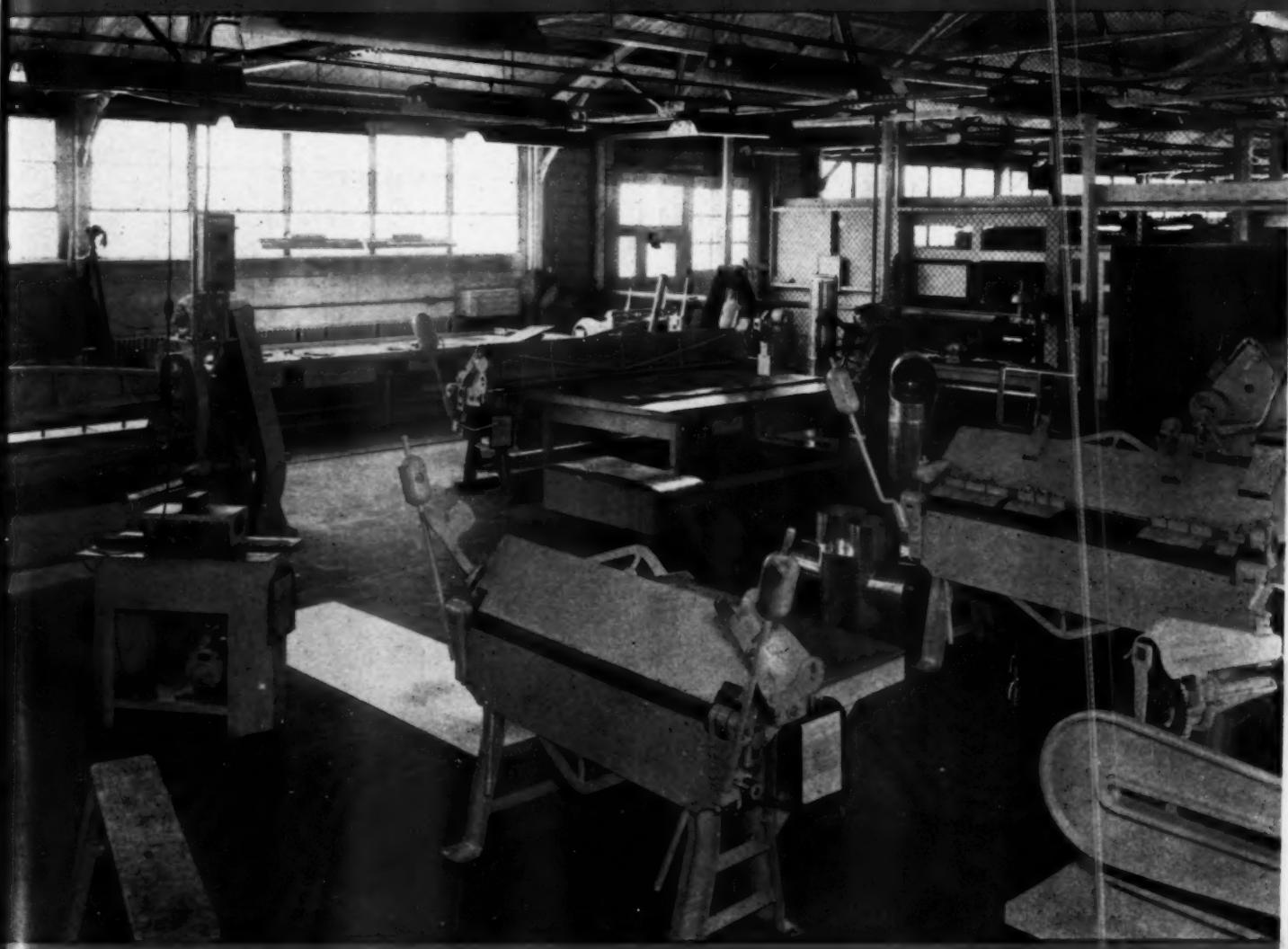


SEPTEMBER 1949

69th Year

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

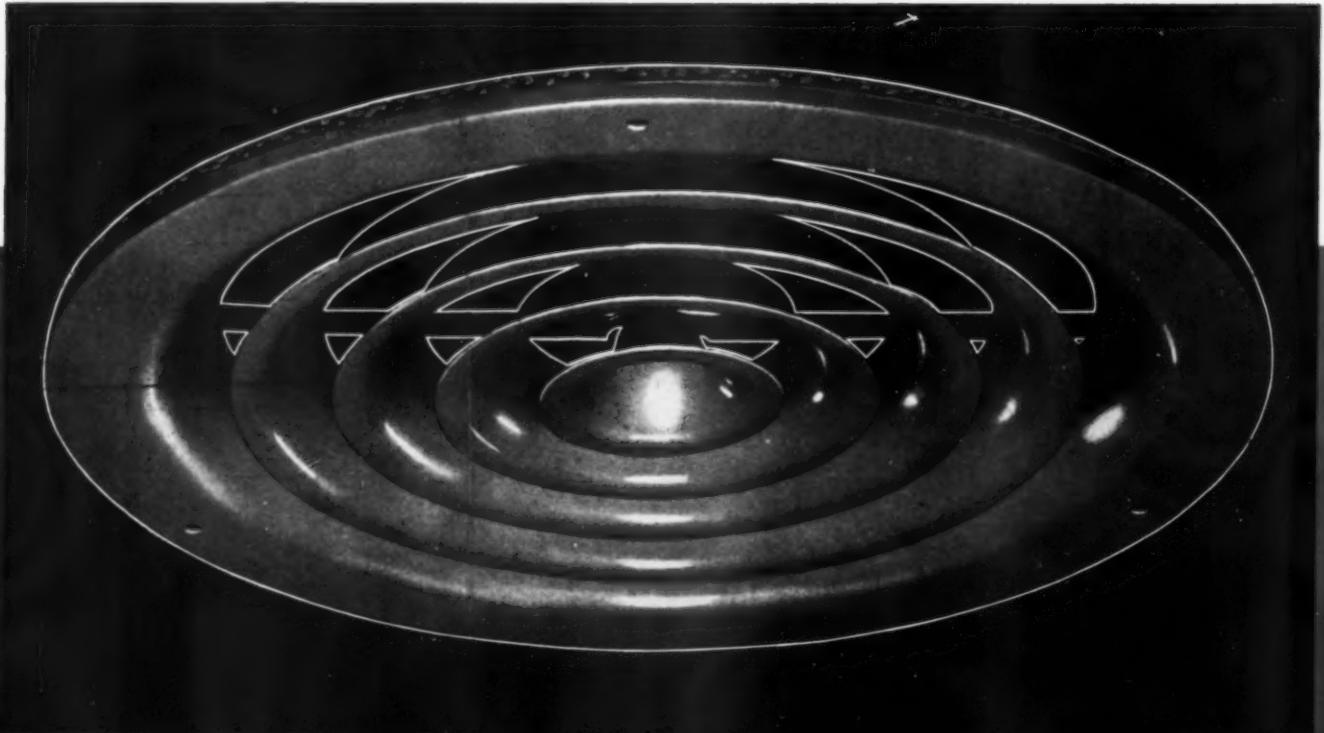


SAFETY PAYS!

Accident prevention is not just a good idea, it is profitable too. A bright, well-arranged shop like the one above pays dividends. See Page 90.

- Arnold Kruckman describes the steel industry's forceful presentation of its case. Page 62.
- Research Residence No. 3 is nearing completion. Warm air floor panels will be studied. Page 86.
- A new series explains the fundamentals of heating and cooling loads. Page 75.
- A column of stimulating sales quips is on Page 152. See Jack Bedford's "Sales Sense."

The New Improved Air Control CEILING DIFFUSERS at Startling Low Prices!



**HERE IS THE ANSWER TO THE PROBLEM OF DRAFTLESS AIR DISTRIBUTION FOR
OVERHEAD HEATING AND COOLING SYSTEMS**

Air Control engineers have redesigned this popular diffuser for greater free area and lower resistance. The contour of the Air Flow Rings smoothly deflects the air with a minimum of resistance, the air pattern does not blow down on the room occupant. Alternate vacuum rings give rapid diffusion.

Remember the Air Control diffuser is a true diffuser, not just an air deflecting grille.

YOU CAN'T BEAT THESE PRICES FOR VALUE

6" size \$1.15 each	10" size \$1.65 each
8" size 1.35 each	12" size 1.95 each
14" size \$2.35 each	

Above List Prices subject to Register Line Discounts. See your AIR CONTROL Jobber today! He has them in stock.

AIR CONTROL PRODUCTS, INC.
COOPERSVILLE MICHIGAN

Waterbury



**The combination
that means the LAST WORD
in Conditioned Air.**

In maintaining its high position among modern winter air conditioning units for the home, Waterbury relies upon Wilson Hair Filters (Honeycomb Type) for dependable air cleaning service—for more cleaned air per filter—for cleaning without clogging.

The famous Edgeseal, the original Hair Filter with the patented "self-sealing" edge.



The Honeycomb, the dressed-up type Hair Filter.

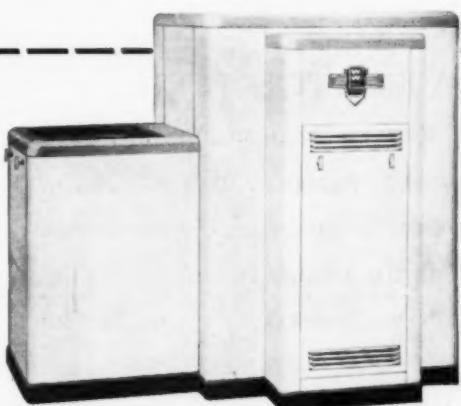
WILSON & CO., INC. (Air Filter Division) 4100 S. Ashland Ave., Chicago 9, Ill.



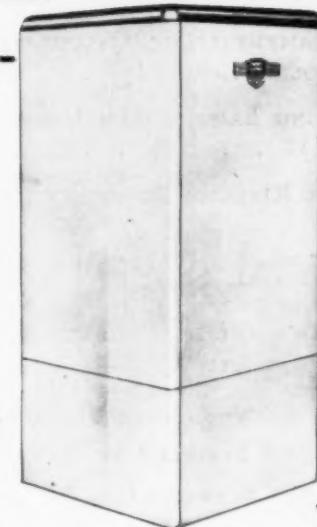
AMERICAN ARTISAN, SEPTEMBER, 1949



6300 Series



1300 Series



Hi-Boy



**Save DELAY... Save
DOUBT... Save DOLLARS!**

Send for FREE samples with details and prices.

Wilson Hair Filters are another quality product of Wilson & Co., Inc.—(World famous for outstanding quality in Meats, Sports Equipment, Pharmaceuticals, Hair Products, etc.)



AMERICAN ARTISAN



Member—Audit Bureau of Circulations
Member—Associated Business Papers



RESIDENTIAL
AIR CONDITIONING
WARM AIR HEATING

SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Murray Hill 9-8293
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Cleveland
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MANAGEMENT SECTION

BUSINESS STRENGTHENS	61
STEEL PRESENTS ITS CASE	62
SIMPLIFIED BOOKKEEPING SYSTEM (IV)	64
BUILD A SALES PERSONALITY THROUGH ADVERTISING	69
NEWS SUMMARY OF THE MONTH	71

RESIDENTIAL AIR CONDITIONING SECTION

FUNDAMENTALS OF CALCULATING HEATING AND COOLING LOADS (I)	75
HEATING BASEMENTLESS HOUSES WITH WARM AIR (II)	80
THIRD RESEARCH RESIDENCE NEARS COMPLETION	86

SHEET METAL SECTION

AN AIRPLANE IS A BUSINESS ASSET	89
SAFETY PAYS!	90
NEUBECKER—CONICAL FLASHING FOR PITCHED ROOF	96
CLEANING STAINLESS STEEL EQUIPMENT	98
COMPLEX SURFACES CAN BE INSULATED	100
MARINE SHEET METAL BUSINESS PLENTIFUL	102

DEPARTMENTS

THE EDITOR'S NOTEBOOK	6
ASSOCIATION ACTIVITIES	107
EQUIPMENT DEVELOPMENTS	108
NEW LITERATURE	144
WITH THE CONTRACTORS	150
SALES SENSE BY JACK BEDFORD	152
INDUSTRY ITEMS	154

Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A.
Copyright 1949 by Keeney Publishing Company.

Publisher—FRANK P. KEENEY
Manager—CHARLES E. PRICE
Production Manager—L. A. DOYLE

Yearly Subscription Price—U.S. and possessions, \$3.00; Canada, Cuba, Mexico, South America, Central America, \$4.00; Others, \$6.00. Single copies, U.S. and possessions, \$.35. Back numbers, \$.60. January, 1949, Directory Issue, \$1.50 per copy. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Milwaukee, Wisconsin.

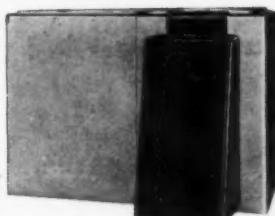
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Founded 1880

SEPTEMBER 1949

Volume 118, No. 9

AMERICAN ARTISAN, SEPTEMBER, 1949

EFFICIENCY * BEAUTY * SAFETY * ECONOMY

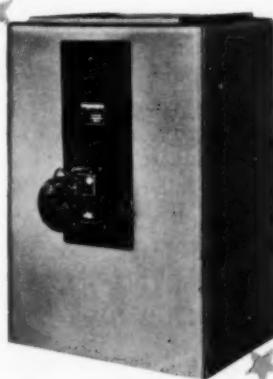


OFB SERIES OIL-FIRED
Forced Air Units—5-Sizes
90,000 to 250,000 B.T.U.

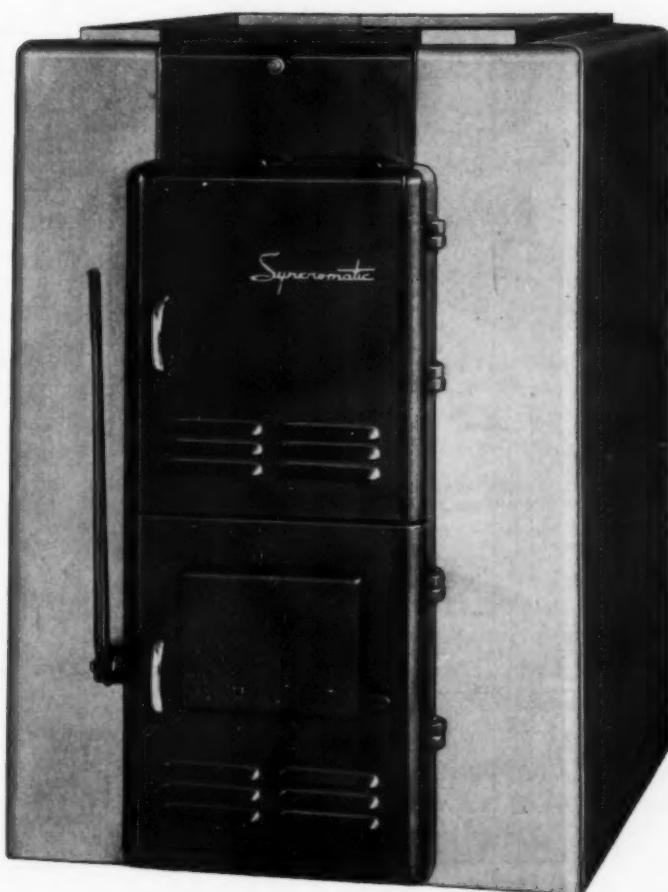
Syneromatic



OFB-621 HI-BOY
Oil-Fired Gun Type Burner
85,000 B.T.U.

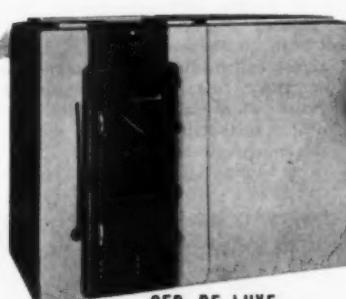


OF-620 VAPORIZING OIL-FIRED
Gravity Unit with Breeze Burner
64,800 B.T.U. at Bonnet



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5-SIZES
70,000 to 183,000 B.T.U.



CFB DE-LUXE
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HI-BOY GAS UNITS
75,000 and
100,000 B.T.U.



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Basement Models—4-Sizes
120,000 to 240,000 B.T.U.

W A T E R T O W N • W I S C O N S I N

the editor's notebook

This Month

In the AIR CONDITIONING section, James J. LaSalvia starts a new series of articles on heat transmission. This month's installment outlines the fundamentals and shows step-by-step how to calculate U values of walls.

An item in the Cleveland News recently announced Mr. LaSalvia's appointment to a new five-man Board of Building Standards and Appeals. The board is charged with administering a recently adopted building code for the City of Cleveland and is made up of an architect, structural engineer, mechanical engineer, builder, and a representative of labor. Mr. LaSalvia will assist in interpreting the sections of the code which deal with the application of air conditioning, refrigeration, heating, ventilating, and plumbing equipment.

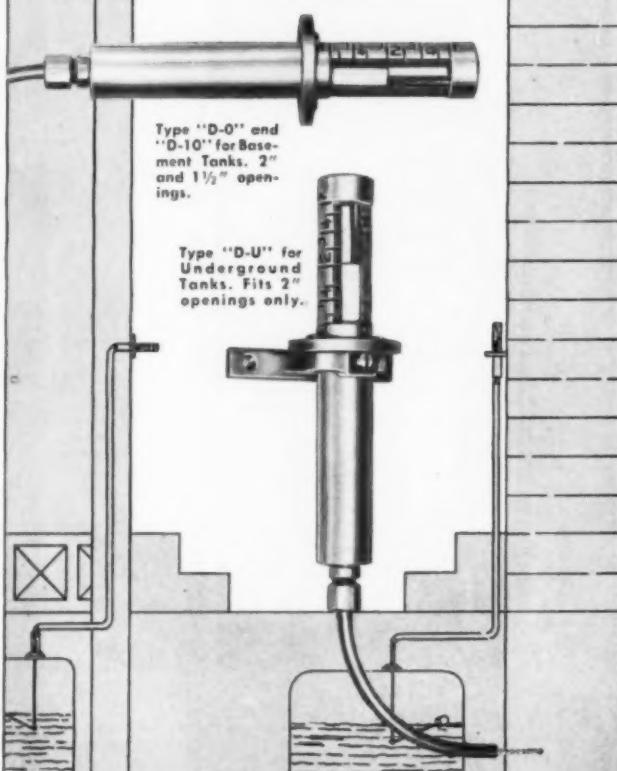
A feature story in the SHEET METAL section discusses workmen's compensation insurance and the all-important subject of safety. Too few contractors realize that their own accident experience influences insurance rates and that insurance does not cover the indirect costs of an accident. The wide variation in rates across the country for sheet metal workers indicates this is a prime subject for unified action by associations in the industry.

Overtime Injustice Corrected

A bill passed by Congress and signed by President Truman does away with the requirement that employers pay overtime on top of overtime to their employees under certain circumstances.

Sentry AT-A-GLANCE REMOTE READING Tank Gauges

For accurate, easy reading of tanks — indoors, outside or underground.



Simple, Inexpensive, Dependable Easy to Install Gauges for every use

Long wanted — long needed. Sentry now brings you remote reading gauges that accurately indicate correct liquid level at all times. Accuracy not affected by changes or variations of specific gravity of oil. Can be installed with or without additional gauge on tank for dual location reading. No unnecessary fittings, bulbs or levers for oil man to tamper with . . . no need for access to building. Stainless steel and brass extension lines—cast aluminum, weather-proof thermometer type indicator, calibrated in fractions. Easy to read — unconditionally guaranteed. Write for descriptive folder showing complete line.



KRUEGER *Sentry* GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

Under a Supreme Court ruling last year, employers were required to include extra payments for Saturday, Sunday or holiday work, or work done outside normal working hours at premium rates, into an employee's straight time rate and compute overtime payments on a basis that included premium pay.

The new act permits employers to exclude from the regular rate of pay premium rates which are one and one-half times or more the regular rate.

The Public Decides

Throughout America's industrial history the public has decided the success or failure of every business venture.

No product can survive without public acceptance of its quality, serviceability, and price.

The public, ever seeking better products at lower prices, and exercising freedom of choice in a competitive market, has inspired American industry to invest hundreds of billions of dollars in research, personnel, new machinery, new techniques, new plants, and new products.

Get Costs Down

One of the greatest needs during a threat of business recession is to get costs down. In order to provide adequate employment it is necessary to maintain the volume of production. This requires more energetic selling efforts. Throughout the war and reconstruction periods it has been necessary to concentrate

You can't build a reputation on what you are going to do.



Bid for Business WITH 3 NEW MEYER GAS LINES...

AGA APPROVED

*Easy TO SELL...
and Keep SOLD*

- ★ Easy to install, — and easy to service
- ★ Engineered for gas — with maximum efficiency
- ★ Exclusive Meyer heat interchanger means fast, low-cost heating
- ★ Heavy steel frame and casing, easily leveled
- ★ Exclusive, new ribbon or fountain burner
- ★ Complete line—75,000 Btu/hr. to 500,000 Btu/hr. input
- ★ Clean, compact and attractively designed

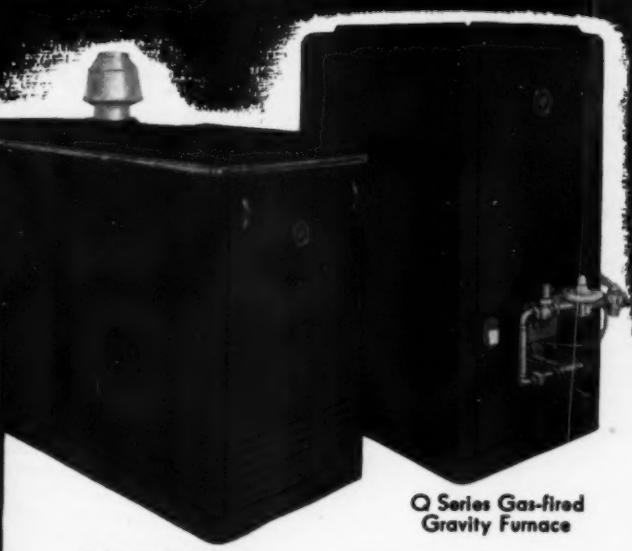


AGA approved for all gases, for both low and high altitude operation.



G Series Gas-fired Air Conditioner

M Series Gas-fired Hi-Boy Air Conditioner



Q Series Gas-fired Gravity Furnace



• Meyer engineered these units for today's market! Make your bid for business with this latest line of Meyer Gas Furnaces and Winter Air Conditioners. They are completely new in design — built to burn gas with the greatest efficiency of any gas burning furnace! And Meyer is easy to install, with no profit-eating return service calls.

Check on Meyer advantages. Here's a complete line from one reliable manufacturer, with undivided responsibility. Write for complete information.

WEIR-MEYER MEANS Modern HEAT

THE MEYER FURNACE COMPANY - GENERAL OFFICES INDOOR COMFORT PEORIA 2, ILLINOIS



Gas-fired
Hi-boy



Gas-fired
Air Conditioner



Gas-fired
Gravity



Oil-fired
Hi-boy



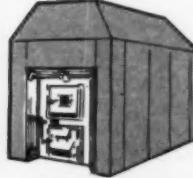
Oil-fired
Air Conditioner



Weir
Steel Furnace



Coal-fired
Air Conditioner



Industrial & Commercial
Heating Equipment

MANUFACTURERS OF WEIR & MEYER FURNACES - AIR CONDITIONERS FOR GAS - OIL - COAL - FACTORIES: PEORIA AND PERU, ILLINOIS

*the editor's
notebook*

on the problems of production. As a result industry and business have become production minded. The urgent need now is to intensify promotional and selling activity.

The proportion of national income now being used for advertising is one-half that of prewar. Thus the most important single tool in merchandising is not being used to full advantage. A smart way to get rid of high cost inventory, clever executives have demonstrated, is to buy more goods at lower prices, mingle the two and clear them out together. How much better that is than holding back orders until high cost goods are sold.

The recent downturn in prices came before many businesses were ready for it. They were caught with soft sales forces. Those who were prepared have done very well.

Pessimism Disappearing

Washington notes a significant change in the attitude of business. Such pessimism as has been in evidence in recent months is disappearing. A very decided change in this respect is now being observed.

A summing up of the encouraging tendencies in the business situation includes these developments:

The downward correction so far this year has been more moderate and orderly than in most prewar recession periods. Government, the banking system, businessmen, and consumers have reacted cautiously, but without panic in this situation.

Interest rates continue low and credit is easily available. Liquidation of inventories has proceeded without undue

There is "VITROLINER" BUSINESS IN YOUR CITY!

ATTENTION Sheet Metal Men

There is a steady demand for VITROLINER CHIMNEY LINERS in every city of the U. S. and Canada. Every home is a prospect, especially where oil or gas is used in the heating plant. If your organization is aggressive and reliable, you can establish a profitable year 'round business in your community.

Our Distributors can supply VITROLINER in quantity quickly and efficiently. We show you how to build a money making business—how to cash in on the tremendous demand for quality VITROLINER CHIMNEY LINERS.



- ELIMINATES FIRE HAZARDS
- CREATES BETTER DRAFT
- REDUCES FUEL CONSUMPTION
- PREVENTS CONDENSATION DAMAGE
- ASSURES LONGER LIFE

VITROLINER, a pioneer product, protects and preserves the chimney from the harmful and destructive properties of combustion. Manufactured from heavy-gauge iron, coated with acid-resisting vitreous enamel.

The actual installation is easy and takes only a few hours for experienced sheet metal men.

Recommended by many leading gas companies, coal and oil burning equipment manufacturers.

- ECONOMICAL
- DURABLE AND PRACTICAL

FOR FURTHER INFORMATION WRITE TO
**CONDENSATION ENGINEERING
CORPORATION**
122 SO. MICHIGAN AVE. CHICAGO 3, ILL.

*the editor's
notebook*

pressure from banks. Reduction of excessive inventories is of itself a hopeful development for the future, although it has recently been contributing heavily to the contracting process.

Industry is apparently still going ahead with its earlier plans for investment in plant and equipment.

While consumers have become increasingly selective in their buying and greater promotional efforts and price concessions must be made to stimulate sales, there is as yet little evidence of large-scale curtailment of consumer purchases, including postponed buying in anticipation of lower prices. In fact, consumers have maintained expenditures for consumption in the second quarter. Purchases of automobiles have recently been at record levels. Residential construction and home buying are now surging forward.

Blind Lead the Blind

Despite prospects for a Federal deficit for the next fiscal year, and the fact that the administration costs of the European Cooperation Administration are expected to rise 50 per cent, Federal officials intend to spend \$500,000 bringing officials of Marshall Plan countries to the United States to learn how to improve fiscal policies.

Another \$800,000 is earmarked for sending ECA envoys abroad to speak on good financial management in government.

Creative salesmen specialize in the wholly impossible . . . doing things nobody ever could do.

The LOCKFORMER

is a

"great equalizer", too . . .



In the early days of the West, a six-shooter was just as strong an argument whether its owner was five-foot-two or six-foot-six! . . . hence its nickname, "The Great Equalizer".

Lockformers are "equalizers" too, for they put a small shop in just as strong a position to get and handle business as they do a big shop. Regardless of how much they could afford to spend, the biggest shops in the Country can't buy a better volume production machine than the Lockformer . . . yet even the smallest shop can easily afford the Lockformer's nominal cost! Write for the new Lockformer Catalog today!

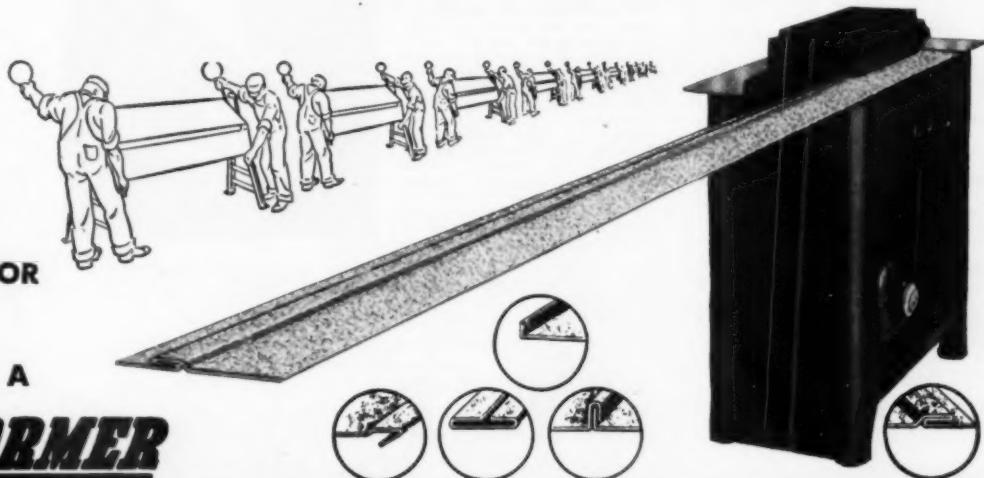
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MEN WITH
EIGHT BRAKES OR

1

MAN WITH A

LOCKFORMER



THE LOCKFORMER CO.

4615 W. ROOSEVELT ROAD

CHICAGO 50, ILLINOIS

*the editor's
notebook*

Letters to the Editors

I am enclosing a transcript of an article that appeared in the real estate section of the *Bergen Evening Record*. The article was prepared as a rebuttal to publicity in favor of wet heat and radiant heat.

FRANK HUDIK

Comfortair Co.
Hackensack, N. J.

Conditioned air has been found to be the most satisfactory and economical method of heating various types of buildings, such as homes and commercial and industrial structures. In the use of air for heating, the owner has a system which has by far the greatest versatility of any type of system. Winter air conditioning . . . provides control at the finger tips. A completely automatic means of maintaining a predetermined temperature with the least amount of override on the thermostat is provided by this system. The reason for this is the instantaneous response of a direct fired furnace. At a moment's notice, the unit responds to any change of temperature in the conditioned area.

In addition to the close control offered by winter air conditioning, the owner has the advantage of cleanliness. All of the air circulated throughout the conditioned area is passed through filters. In most cases, these filters . . . should be changed before the beginning of each heating season . . . for maximum efficiency.

Not only is the air thoroughly cleaned but a percentage of fresh air may also be introduced into the duct system, eliminating the stagna-

2 NEW SALES-CLINCHING FEATURES - Designed Exclusively for Nu-Way OIL BURNERS

1 NEW!

FRACTIONAL HORSEPOWER MOTOR

Designed and manufactured by Nu-Way to meet exact requirements of Nu-Way Oil Burners. Removable cover allows ready access to thermal cut-out switch and magnetic starting switch inside motor housing. Tested and approved by Underwriters' Laboratories.



2 NEW!

AIR-COOLED STEP-UP IGNITION TRANSFORMER

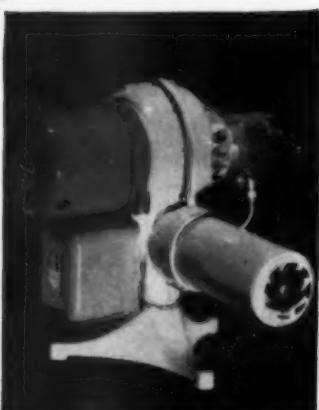
Rugged construction meets needs of continuous and intermittent operation. Special shield eliminates radio interference. Engineered and manufactured by Nu-Way to meet exact specifications of Nu-Way Oil Burners.



MORE SALES... GREATER PROFITS... ADDED PRESTIGE with Nu-Way OIL BURNERS

The new fractional horsepower motor and the air-cooled ignition transformer are two more important reasons why the Nu-Way line will increase sales and profits for you. Nu-Way's greater durability, operating efficiency and economy are making new friends every day. Look to Nu-Way for further advancements designed specifically for oil burners. Remember that Nu-Way Oil Burners are designed, constructed and tested by Nu-Way engineers in the Nu-Way plant.

The Nu-Way line is backed by 28 years of oil-heating experience and promoted nationally by a consistent hard-hitting advertising campaign, sparked by ads in the nation's top home publications.



Write today for new folder containing details on the Nu-Way Line of oil burners.

THE

Nu-Way

CORPORATION

ROCK ISLAND, ILLINOIS

Sold Through Jobbers and Distributors
Also Special Applications for Furnace and Boiler Manufacturers
"Automatic Oil Heat Exclusively Since 1921"



*the editor's
notebook*

tion of air that is commonly found in a wet type of heating system. Winter air conditioning further provides the circulation of air during the heating season, which further tends to eliminate this stagnation.

Another feature of winter air conditioning is its humidity control. This controls and introduces a percentage of moisture into the conditioned area. Humidification prevents furniture from drying out, cracking, or coming apart at the seams.

It is also possible to utilize the fan of the heating system for ventilation in the summer time by merely switching over to a summer switch which is usually located on the fan-limit control, operating the blower and providing circulation of air for the summer season exclusive of the firing of the unit.

The easiest way to crush your laurels is to rest on them.

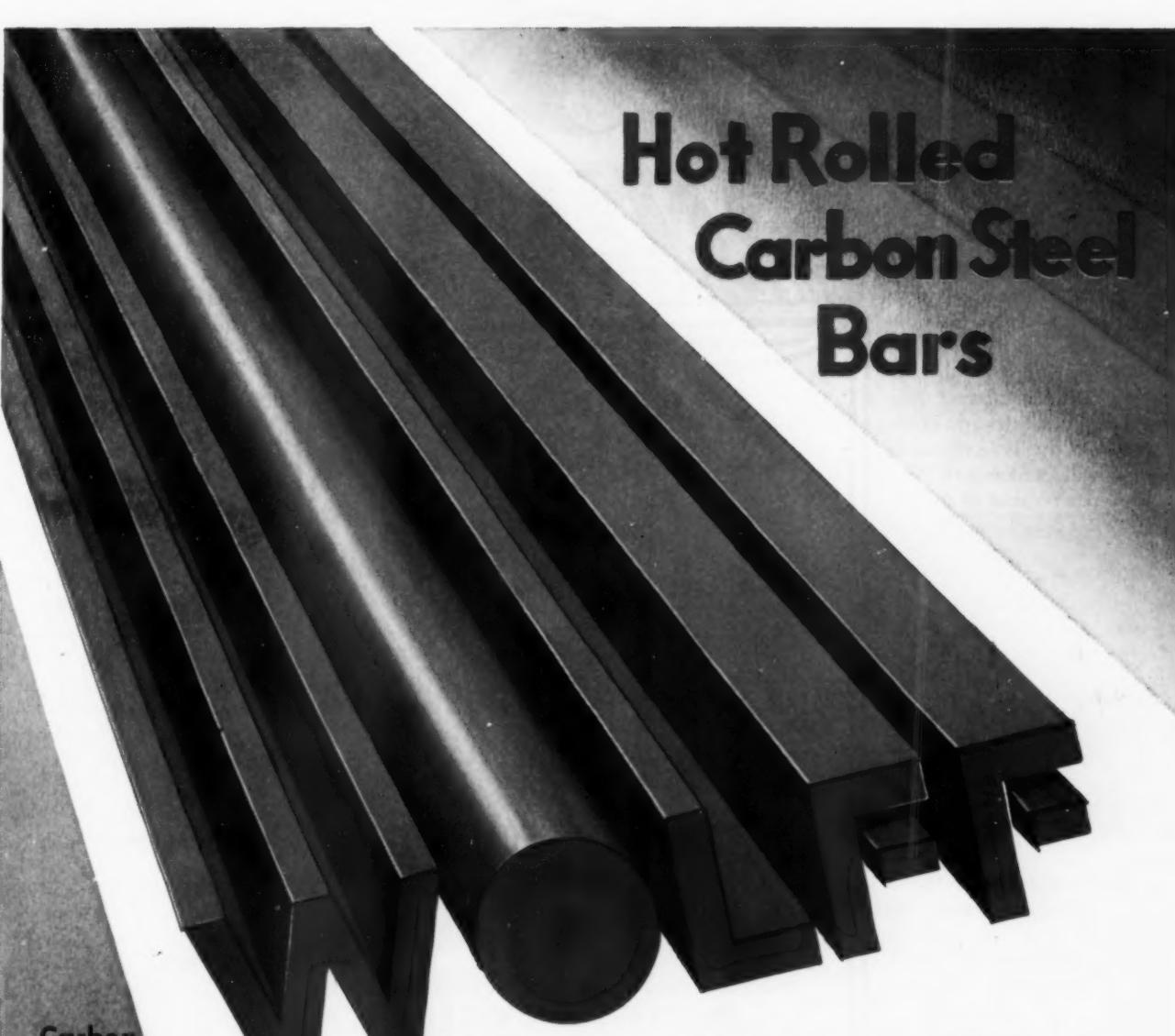
A winter air conditioning unit may be fired with coal, coke, oil, or gas.

A properly installed winter air conditioning system will provide for the owner an economical and trouble-free system for at least 20 to 30 years.

The owner of a system that conditions the air has none of the worries experienced with a wet type of system. There are no pipes to rust and break, no possible water leakage, no knocking radiators, no worry about the water level in the boiler, and no hot radiators on which the members of the household can burn or injure themselves.

Winter air conditioning has proved very successful in heating commercial buildings,

Hot Rolled Carbon Steel Bars



Carbon
Steels
Stainless
Steels
Aluminum
Copper
Tin Plate
Metal
Decorating



Metal Service

for bars and shapes that assure your satisfaction

If you're not now using Wolff Metal Service as a supply source, perhaps you're missing something really helpful to your business . . . for bar stock is a specialty product at Wolff that has won many friends for this metals warehouse.

You'll find just what you are looking for in the well balanced stocks that Wolff carries. Galvanized bars and strip are also available for your convenience. You can depend on Wolff delivery service, too, the fastest, most responsive in the Midwest. Please write, or call **WALbrook 5-3200**

BENJAMIN WOLFF & COMPANY

General Office and Warehouse - 5800 South Selden Ave., Chicago 36, Ill.

Wisconsin Office — 176 W. Wisconsin Ave., Milwaukee 3, Wis.

the editor's notebook

schools, churches, and theaters. Architects and builders with foresight are daily planning and providing for the use of conditioned air for heating, cooling, and ventilating proposed new buildings and in the near future this type of conditioning will predominate over other types because of its versatility and adaptability in meeting these problems.

(Frank Hudik, author of the above article, is a member of the American Society of Heating and Ventilating Engineers.)

Don't hide part of your sales story . . . customers may get the wrong impression. Remember the motorist who was knocked unconscious in an accident. When he was picked up and being carried to a nearby service station he opened his eyes then suddenly began to struggle to get away. Later he explained: "When I came to I saw a Shell sign and someone was standing in front of the S."

A recent article on the use of aluminum which appeared in a national business paper serving the roofing and sheet metal field should be clarified to some extent. It would appear that the statements made represent one man's experience and should not be construed as general.

Several paragraphs in the article would require further explanation to justify the statements. The statement that aluminum can be used on 98 per cent of the jobs is highly extravagant. To date there has been no satisfactory method devised for soldering aluminum. Therefore its use for linings of false bottom gutters,



TAILOR-MADE QUALITY for the MASS-HOUSING MARKET



NEW UNITS — NEW DESIGNS BETTER THAN EVER!

- 6 SIZES COUNTER-FLO BASEMENT TYPE
65,000 - 85,000 - 100,000 - 135,000 - 165,000
200,000 B.t.u.
- 3 SIZES UTILITY TYPE HI-BOYS
65,000 - 85,000 - 100,000 B.t.u.
- 2 SIZES GRAVITY FURNACES
60,000 - 80,000 B.t.u.

Write for New Literature on COUNTER-FLOW HI-BOYS for FLOOR PANEL HEATING

Built and Priced for
YOUR PROFIT

Write

J. V. PATTEN COMPANY

Sycamore, Illinois
Originally Established in 1898
Incorporated in 1928

the editor's notebook

all types of saddles, or wherever a perfectly water-tight joint is required, is excluded.

We would refer specifically to our own case during the six months period ending in July, in which our use of stainless steel, copper, brass, and bronze represented 99 per cent and aluminum 1 per cent.

We speak of aluminum from our experiences in 1947 and 1948 when our requirements were in the large tonnage bracket and while we feel the material has considerable merit, we disagree with the author of this article when he says it can be used on 98 per cent of the jobs.

R. E. MANSFIELD
James Mansfield & Sons Co.
Chicago, Illinois.

I was very much interested in the article "Custom-Made Evaporative Cooling Systems Fit Individual Requirements" in the June issue.

Would you please send me a text book or technical literature on the subject? I would like to know how to figure cooling requirements, duct and fan sizes, etc.

Also, please send Professor S. Konzo's "How, What and Why" which explains the winter air conditioning code and manual.

WEBB PATTERSON
Moravia, N. Y.

A comprehensive text book devoted exclusively to evaporative cooling apparently has not been published. We suggest manufacturers of this equipment as a source for technical data.—ED.

Address the editors
6 North Michigan Avenue
Chicago 2, Illinois

Aerofuse

IN SAN FRANCISCO



AEROFUSE AT MAGNIN'S



AEROFUSE AT DOHRMAN'S



AEROFUSE AT MACY'S



AEROFUSE AT THE CITY OF PARIS



The new Type EAC is equipped with a manually-operated auxiliary effective area control ring that provides a simple method of varying performance by adjustment of throw . . . No. 4 Control Unit assures minute regulation of volume. Another recent addition to the Aerofuse line, Type ES meets the need for a fixed-type high capacity diffuser.

A Partial List of Other Aerofuse installations in the San Francisco Area

- Philippine Air Lines
- V. C. Morris
- Pacific Gas & Electric Co.
- Real Estate Associates Bldg.
- Wells Fargo Bank
- Call-Bulletin Bldg.
- Ross Bros.
San Jose
- Oakland Army Base Warehouses
Oakland
- Crocker Union Bank Bldg.
San Bruno
- S. S. Lurline
S. S. Matsonia

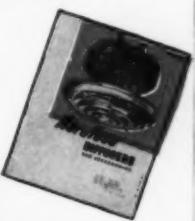
It isn't surprising that important air conditioning installations on San Francisco's famed Union Square — and, in fact, throughout the city — are Aerofuse Diffuser installations. Experience has proved that for efficient performance, for smart appearance, for initial-cost economy, Aerofuse Diffusers meet the most exacting specifications of engineers, architects, contractors, and building owners alike . . . at the vital point of air delivery!

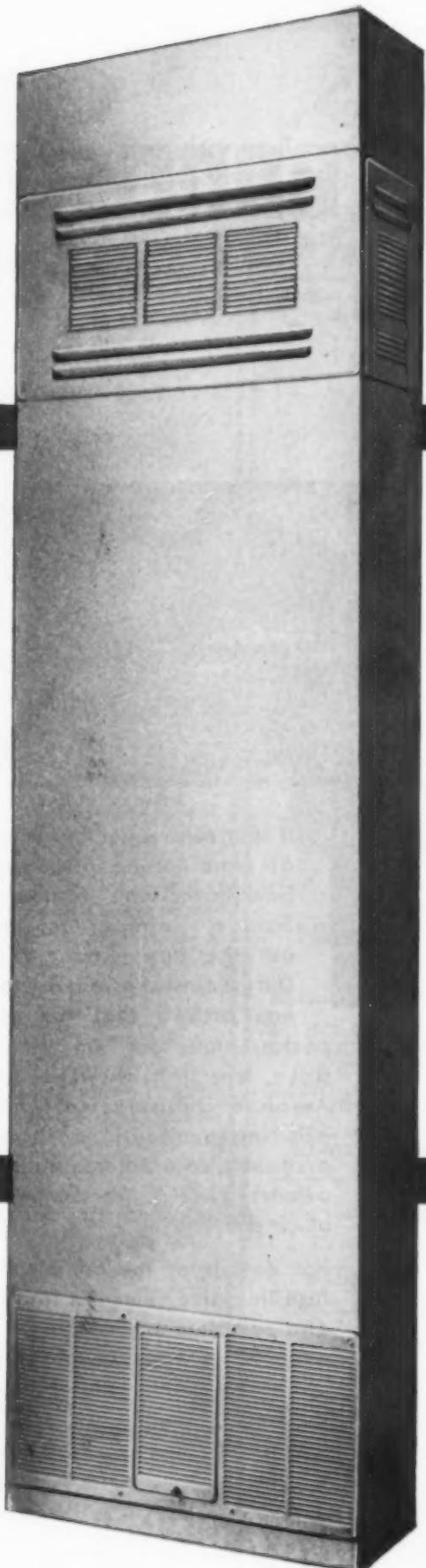
For details of the complete Aerofuse line, size selection information and complete engineering data . . . write for a copy of Catalog 102.



TUTTLE & BAILEY Inc

NEW BRITAIN, CONNECTICUT





**the sensational
royal jet-flow
means extra profits
this heating season**

The new easy to sell Royal Jet-Flow gives all the advantages of a forced air unit . . . yet costs only slightly more than a highly competitive floor furnace.

Through the use of the jet principle the gas-fired Royal Jet-Flow achieves the amazing velocity of 300 feet per minute without blower or fan. Heats an entire house with a minimum of temperature differential from room to room and ceiling to floor.

The new Jet-Flow is designed to be installed with a minimum of labor and a maximum of profit . . . is now, for the first time, available for general distribution.

Exclusive dealerships are open

in certain areas . . . write today and find out all about the new easy to sell, easy to install Royal Jet-Flow. Don't pass up this extra profits opportunity.







OVER 50,000 INSTALLED IN HOMES BY AMERICA'S LARGEST BUILDERS

True test of heating equipment is its acceptance and performance. Here are excerpts from letters by builders who have had hundreds of Royal Jet-Flows installed in houses they have built.

FRITZ BURNS
Kaiser Community Homes

6000 Royal Jet-Flows
"The Royal Jet-Flow . . . has become one of our best salesmen. It has given top performance under all conditions. In appearance, design, economy and engineering we feel that the Royal Jet-Flow is the perfect answer for modern homes."

M. J. BROCK
M. J. Brock & Sons, Inc.

210 Royal Jet-Flows
"We have found the Royal Jet-Flow to be one of the major selling points in our subdivisions . . . a remarkable development in home heating . . . giving the small home owner the type of heat heretofore available only in a high-cost home."

J. R. ASHTON
Del E. Webb Construction Co.

825 Royal Jet-Flows
"We investigated every type of heating equipment in the nation before making a decision to use the Royal Jet-Flow. It offers such advantages as clear wall space for furniture placement, excellent heat distribution . . . Our experience is proving this superior heating equipment places us at a distinct advantage in today's competitive market."

A. QUINCY JONES
Architect

825 Royal Jet-Flows
"We feel the Royal Jet-Flow has proven itself as being everything that was expected or hoped for. Since the project was completed, I have talked to many families living in the houses and they were very enthusiastic about their heating equipment."



ROYAL
HEATERS, INC.

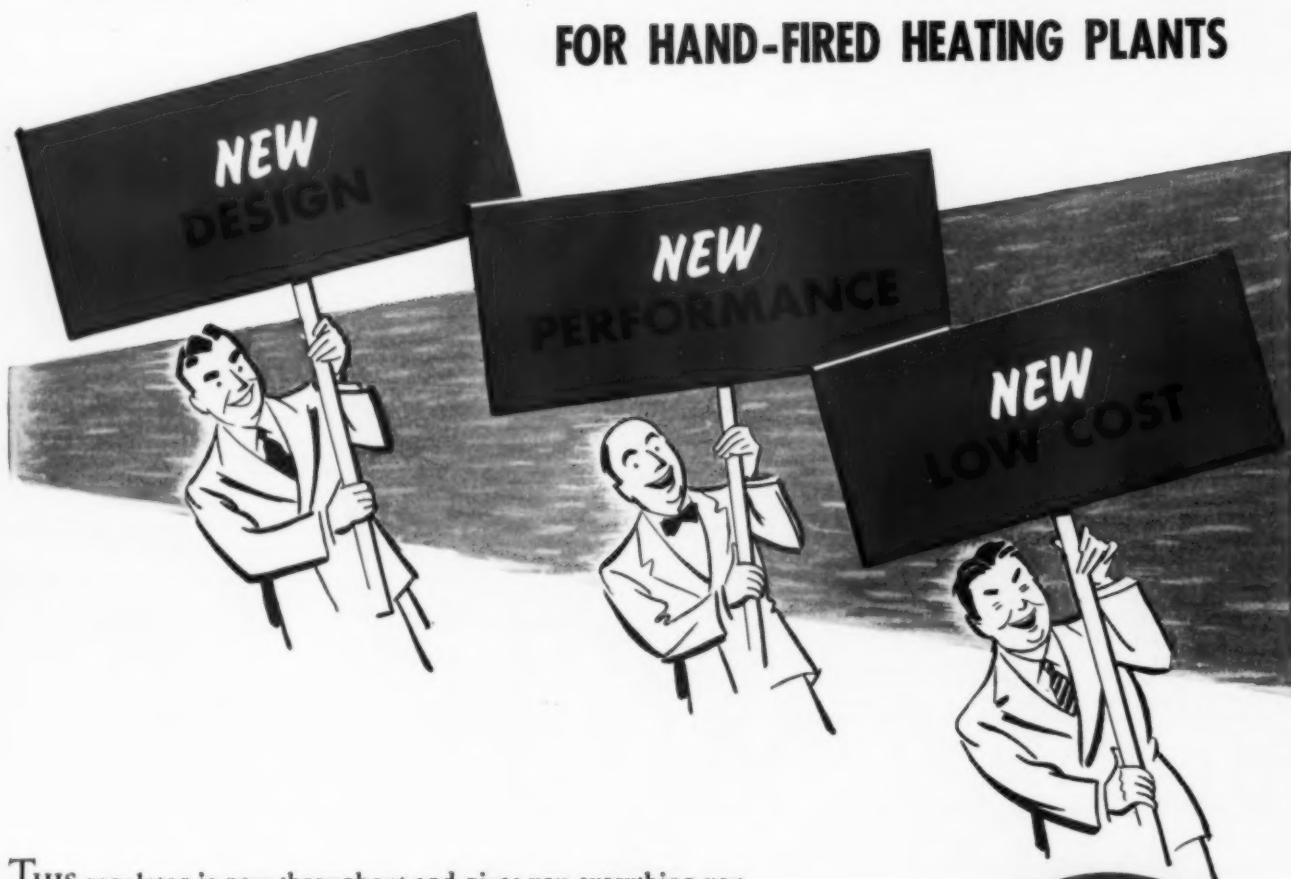
Write or phone:

1024 WESTMINSTER AVE.
CUMBERLAND 3-2117
ALHAMBRA, CALIFORNIA

Honeywell

A Startling New Heat

FOR HAND-FIRED HEATING PLANTS



THIS regulator is new throughout and gives you everything you want—including an attractive low price to meet today's market.

The new power failure motor is remarkably simple, has ample power, a built-in transformer, and is plugged in for ease of installation. An efficient impulse pump provides the hydraulic action to operate the crank arm and compression spring—when the circuit is broken normally or by power failure the spring slowly returns the crank arm to the closed position. Safe against fire hazard—the dampers operate quietly—and a complete set of fittings are supplied with each package.

The new sensitive thermostat is especially designed to give short regulated operations that save fuel and contribute to accurate control of room temperatures.

The new type Y219A Electric Janitor Regulator will be available for October delivery—place your order now. Minneapolis-Honeywell Regulator Company, Minneapolis 8, Minnesota. In Canada: Leaside, Toronto 17, Ontario.

ONLY
\$22⁹⁰
LIST PRICE

ANNOUNCES...

Regulator Package!!





RYBOLT SERIES RS 85
Steel Gas Winter Air Conditioner



RYBOLT SERIES RSG 85
Steel Gas Gravity Furnace

Rybolt STEEL GAS FURNACES

SPACE AND FUEL SAVERS THAT MEET TODAY'S NEEDS

In line with today's requirements these Rybolt gas-fired units are unusually compact to save space—they can be installed anywhere in basement or first floor utility room.

They save fuel, too, because the scientifically engineered heavy gauge steel heating elements provide rapid heat transfer which facilitates fuel consumption economy.

Installation cost also is reduced to a minimum because the RS 85, the small air conditioning unit, and the RSG 85, the gravity unit, come completely assembled as package units. The RS 110, the larger air conditioning unit is shipped knocked down but is extremely easy to assemble on the job with very few screws or bolts, because of its slip joint construction.

Another big advantage, permitting ease of service and inspection, is the fact that the heating element can be readily removed without dismantling the furnace.



RYBOLT SERIES RS 85, steel-gas fired winter air conditioner (85000 BTU) is unusually compact, convenient and economical.

RYBOLT SERIES RS 110 is the same design as RS 85 but larger in size (110,000 BTU).

RYBOLT SERIES RSG 85 is a steel gas-fired gravity furnace, compact, simple to operate and economical, comes in one size only, (85000 BTU).

Write for full information



THE RYBOLT HEATER COMPANY
615 MILLER STREET

ASHLAND, OHIO

In COMPETITIVE Situations
these H & C REGISTERS
Give You a Real
Advantage!

**WHEN THE JOB CALLS FOR
 AIR CONDITIONING AT ITS BEST**



... it's the H & C No. 75 Register that gives you the edge. For with this register, the only one to have the INCOMPARABLE TURNING BLADE VALVE, you can positively assure your prospect better air

distribution than can be obtained with any popularly priced conventional register of the multi-shutter type — without adding ONE CENT to the cost of the job!

**WHEN ROCK-BOTTOM PRICE
 IS A MAJOR FACTOR**



... you can talk price with the H & C No. 74 air conditioning register and still have plenty of extras to win the decision: Quality construction, finish and workmanship that is unsurpassed by any register on the market regardless of price; easily obtained upward and

downward deflection; a valve that is smooth as silk in operation and that stays put at any desired position even under high velocity. Everyone prefers a quality job when it doesn't cost more!

See

these registers at your H & C Jobbers' or write for No. 49 catalog giving complete information on the ideal register for every type of gravity or air conditioning installation.



WORLD'S LARGEST MANUFACTURERS OF REGISTERS, GRILLES AND FURNACE ACCESSORIES

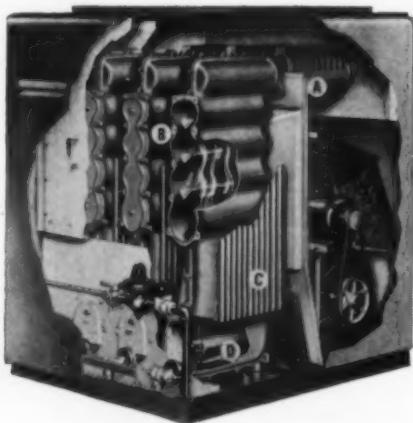
IN CANADA:

HART & COOLEY MANUFACTURING CO., FORT ERIE, N. ONTARIO

AMERICAN-Standard

First in heating . . . first in plumbing

The
MOHAWK
 gas fired
 Winter Air Conditioner



Every home is a prospect
 for this Winter Air Conditioner
 . . . AND IT'S EASY TO SELL!

■ Made in nine sizes . . . with capacities ranging from 60,000 to 300,000 Btu. input per hour, the moderately priced MOHAWK puts completely automatic gas fired winter air conditioning within the reach of practically all of your prospective customers.

Its beautiful, streamlined jacket makes this unit stand out on any sales-floor . . . and will harmonize with the smartest basement decorative scheme. And when you point out the Mohawk's superb engineering features—its fuel-saving efficiency, trouble-free service, and long life, you'll find this quality winter air conditioner easy to sell.

For full information about the Mohawk and other warm air heating equipment in the Sunbeam line by American-Standard, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pa.**

A. PRE-HEATED AIR. Prior to entering the heating element, the return air from rooms is drawn over these hot radiators. Thus the air is pre-heated before it enters the heating compartment—saving fuel, increasing efficiency.

B. CAST IRON HEATING ELEMENT. Made in two sections of durable cast iron. The faces of both sections are precision ground and packed with asbestos wicking to form a leakproof joint.

C. RADIATION SHIELD. Corrugated shield cuts heat loss into basement. Increases efficiency by providing extra heating surface. Placed between each heating element and on sides of end elements.

D. EFFICIENT BURNER. Made of cast iron with patented high temperature alloy, corrugated ribbons. Burns manufactured, natural, mixed or liquefied petroleum gas uniformly, efficiently and sparingly. Quiet, dependable, durable.



Look for this

Mark of Merit

★ ★ ★ ★ ★

Here's the Ticket



here's the Line

-to better business in '49!

When you sell American-Standard products you get all the selling aids you need to bring in more business. Ask your Wholesale Distributor for details of this powerful new advertising and merchandising program.

Serving home and industry

AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

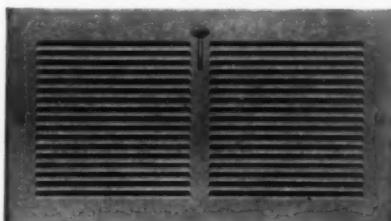
For
Right or Left,
or for
Up or Down
Direction—
use these
Fine Quality

AIRO-FLEX

*Single Valve
Adjustable Registers*



Airo-Flex "7000" Series has horizontal fins with up or down deflection.



Auer offers this popular Airo-Flex "4000" Series with vertical adjustable fins, for sideway directional flow. For your forced air or air conditioning jobs, where single or 2-way lateral deflection is sufficient, this moderate priced, top quality design, in both appearance and efficiency, may well be classed with more expensive registers. It has single valve, operated by exclusive, patented spring tension device, permanently positive. Fins are bendable on the job (set when shipped at 22°, half left, half right). This "4000" Series is unusually neat and substantial in construction, well turned out and finished, a credit to any job. Available in usual wall or baseboard models, also intakes. The same type register for up-or-down deflection, in the "7000" Series, is shown below.

Auer makes a complete line of modern and attractive floor, base, and wall registers and return faces—designed and styled by experts—for gravity or air conditioning, including all directional types. We also supply perforated metal grilles, in all materials and sizes, for ventilation, concealment, enclosure or other purposes.

Ask for Auer Register Book—or special Grille Catalog "C".

THE AUER REGISTER CO., 3608 PAYNE AVENUE, CLEVELAND 14, OHIO

Auer REGISTERS
& GRILLES for AIR CONDITIONING & GRAVITY

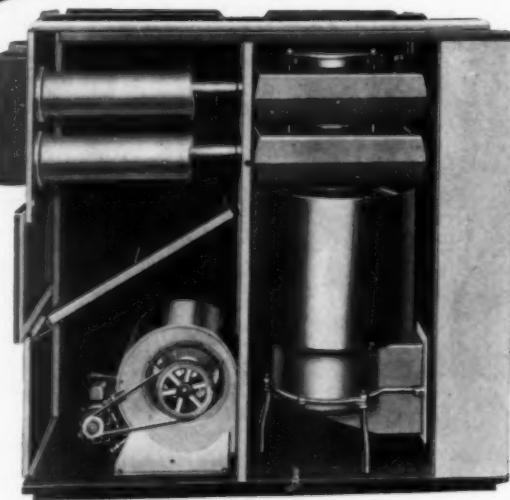
NOW You're IN ON THE BIG GAS JOBS!

with the New Luxaire CAST IRON...GAS FIRED Air Conditioning Units



Front view of No. CA-140 Unit, 140,000 BTU input.

**CAPACITIES UP TO
200,000 B.T.U.**



No. CA-200 Side interior view of
No. CA-200 unit, 200,000 BTU input.

"Something new has been added" to the Luxaire line of Gravity Furnaces and Air Conditioning Units—larger sizes of CAST IRON, GAS FIRED Air Conditioning Units with up to 200,000 BTU Input per hour!

The Luxaire CAST IRON, GAS FIRED series of Gravity Furnaces and Air Conditioning Units now ranges from inputs of 50,000 to 200,000 BTU per hour! Now, you and practically every homeowner, builder and architect who prefer gas equipment with Cast Iron Heating Elements can obtain the type and size that they require from Luxaire. Completely new in conception and design, Luxaire cast iron gas fired units have such advanced, 1949, features as:

1. Round Combustion Chamber.
2. All joints between combustion chambers and radiators are horizontal joints, leak-proof and gas-tight with cementing.
3. Round, Ribbon type gas burner.
4. Radiator, or complete heating element can be removed

for cleaning without dismantling cabinet or disturbing cabinet top, plenum chambers or ducts.

Write for new catalog just off the printing press. In addition to Cast Iron, Gas Fired Equipment, the complete Luxaire line includes gravity furnaces and air conditioning units, of steel as well as cast iron construction, for all fuels, oil, coal and gas; also the new Counterflow units, Gas or Oil fired, that discharge the air downward through the base of the cabinet.

See your Luxaire jobber for complete information.



Series A
Gas-Fired,
Steel
Air
Conditioning
Unit



Series H
Gas-Fired,
Steel
Utility Air
Conditioning
Unit



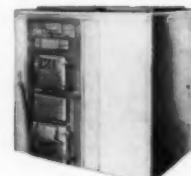
Series D
Gas-Fired
Air
Conditioning
Unit; also
available in
Utility and
Gravity Fur-
nace models.
Convertible to
Gas



Series G
Gas-Fired,
Steel,
Grav-
ity
Furnace



Series V
Vaporizing Oil-
Fired, Air
Conditioning
Unit;
also available in
Utility furnace mod-
els. Convertible
to Gas



Series AC-700-F
Coal-Fired, Steel,
Air
Conditioning
Unit



Series No. 700
Coal-Fired, Steel,
Gravity
Furnace;
also available with
Round Casing



Series C
Coal-Fired, Cast
Iron, Gravity Fur-
nace; also available
with Square Casing,
and in Pipeless
style

THE C-A-Olsen MANUFACTURING COMPANY

Luxaire



HEATING & AIR CONDITIONING UNITS

ELYRIA, OHIO

CHIP, CUT, DRILL, GOUGE

with *Thor*

**PORTABLE
ELECTRIC
HAMMERS**



*Thor U-100 Hammer
with the "Sling Shot Drive"*

1600 power-packed blows per minute with Thor Hammers save time and money on hundreds of construction, maintenance and repair jobs. Use them in working stone, concrete, wood, metal and other materials—drilling, channeling, cutting, gouging, chipping, scaling, etc. *Thor's famous "Sling Shot Drive" puts more wallop into every blow.* YOU PROFIT BY LOWER JOB COSTS. Let a demonstration show how. Your nearby *Thor distributor* will gladly arrange one at your convenience.

INDEPENDENT PNEUMATIC TOOL COMPANY

Aurora, Illinois

Thor offers a full selection of hammer tools for working with wood, brick, stone, metal composition and other materials.

Birmingham Boston Buffalo Chicago Export Division: 330 West 42nd St., New York 18, N.Y.
Los Angeles Milwaukee Seattle New York Cincinnati Cleveland Denver Detroit Houston
Salt Lake City San Francisco Philadelphia Pittsburgh St. Louis St. Paul London, England

PORTABLE POWER

Thor
TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

Dealers! Gilbarco has

of money-making

A Wide Range of Different
Types and Sizes

Designed and Packaged
to Cut Installation Costs



A NEW TYPE OF WARM AIR FURNACE FOR CEILING SUSPENSION

For low cost heating of homes, garages, service stations, stores, warehouses and similar buildings. A complete, factory-assembled unit, easy to install.

Economical to buy and to operate . . . Made in 3 Sizes — 100,000 BTU, 150,000 BTU, and 200,000 BTU Capacity. Right and left hand models.

GILBARCO WARM AIR CONDITIONERS

Four new, high-efficiency models! Improved compact design. Easy to install and economical to run. Attractive styling, beautiful finish.

4 CONVENIENTLY SIZED MODELS

100,000 BTU	175,000 BTU
140,000 BTU	225,000 BTU

And in Addition, a Vertical Floor Model "Space-Saver" of 100,000 BTU Capacity

Occupies less than three and a half square feet of floor area. Ideal for installation in utility rooms or wherever space is at a premium. Packed with efficiency PLUS!



LEARN ABOUT GILBARCO'S Complete Modern Line of Heating Equipment. Valuable territories are open west of the Appalachians. Write today for full information.

a complete new line

modern HEATING EQUIPMENT!



The Latest in
Advanced Engineering



Backed by Gilbarco's
Unequaled Manufacturing Experience



NEW GILBARCO GCN OIL BURNER—

For the volume market. Trim, modern hood protects burner and adds to customer eye appeal.

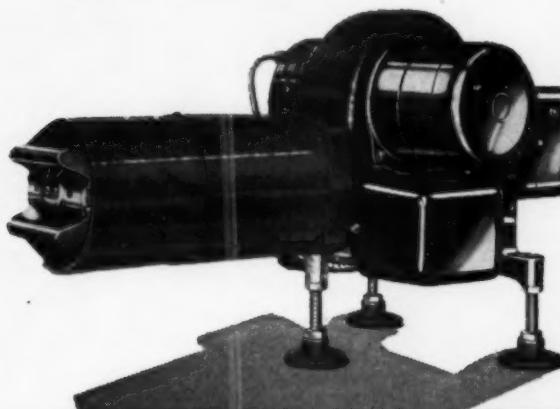
Easy installation — easy cleaning and adjustment, as operating parts are exposed when hood is removed.

Gilbarco Oil Burners for larger homes and commercial installations come in four sizes from 2 to 25 gallons per hour capacity.



And for apartments, factories and other large buildings a complete line of industrial oil burners up to 110 gallons per hour capacity.

MODERN, COMPACT BOILER-BURNER UNITS — Both steel (packaged) units and cast iron models for easy installation, attractive appearance! Economical heating for hot water or steam . . . with built-in tankless heater for hot water supply.



THE OIL BURNER WITH THE ECONOMY CLUTCH

Gilbert & Barker Manufacturing Co.
W. Springfield, Mass., & Toronto, Can.

**BETTER,
FASTER
SHEET METAL
WORK
with
WISS**

METAL-MASTER SNIPS

Examples of intricate designs which can be cut with Metal-Master Snips.

CUTS STRAIGHT

CUTS TO RIGHT

CUTS LEFT

YOU NAME THE JOB! Metal-Master compound leverage snips cut heavy sheet metal with amazing ease . . . inside holes, intricate patterns and curves, or standard cutting jobs. Here are just a few of the uses for which thousands of metal workers prefer them:

Making cornices • laying out leader boxes • laying out roof and drain flashings • ornamental work on leaders and gutters • all kinds of duct work, including air conditioning and hot air heating • cutting corners in kalamein work • installing kitchen and soda fountain equipment • neon sign work • cutting metal strips in linoleum laying • installing metals for store fronts, etc. In addition, Metal-Masters by the thousands are used in general maintenance work throughout industry.

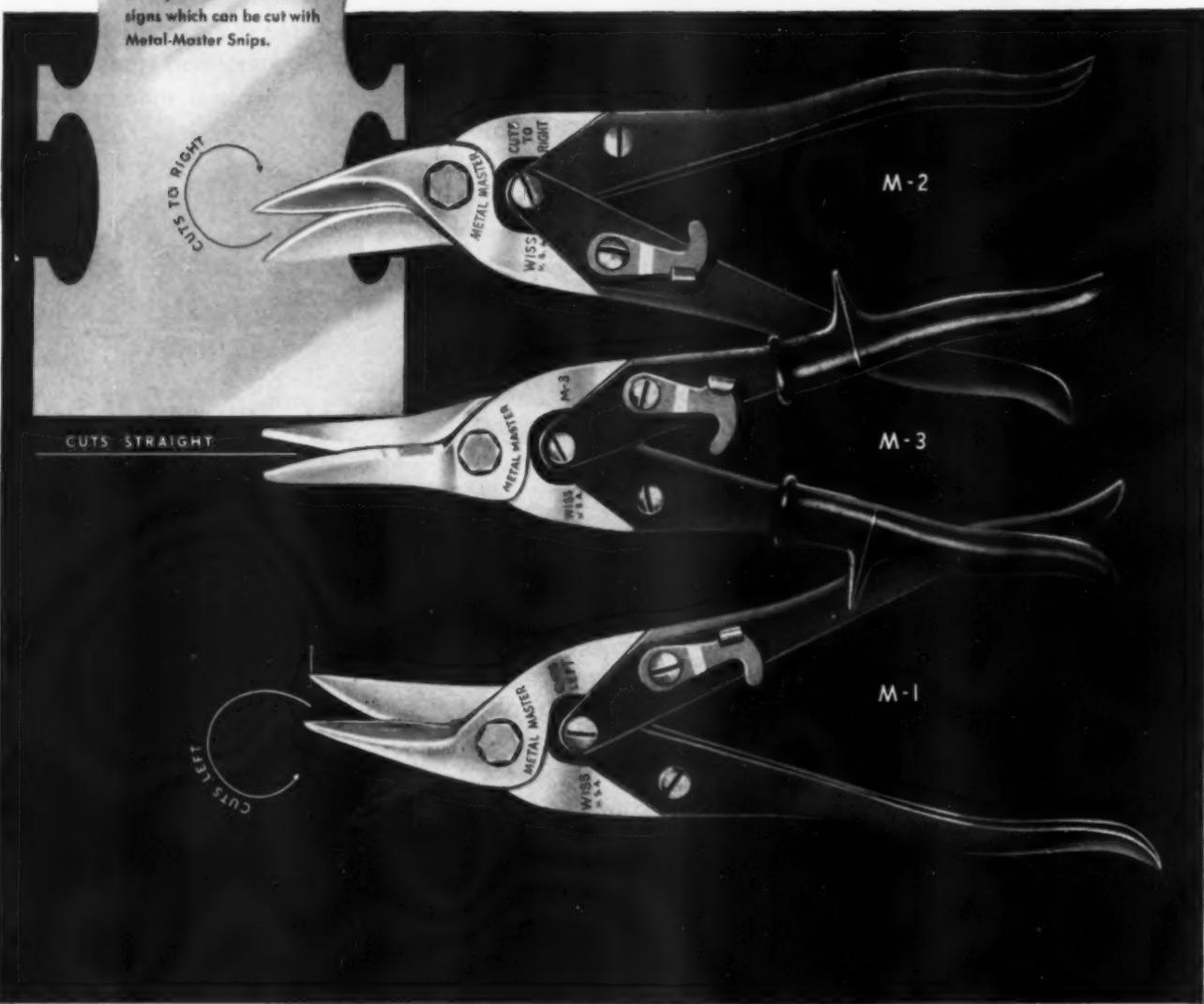
Quality for over a Century

J. WISS & SONS CO., NEWARK 7, NEW JERSEY

M-2

M-3

I-W



CHECK THE FACTS and you'll find WILLIAMS OIL-O-MATIC
is EASIER TO SELL than to
SELL AGAINST!



POSITIVE ACTION
"locks off" oil
in burner
NO OVER-RUN!

ONLY Oil-O-Matic has this marvel of engineering simplicity—the amazing Hydraulic Shut-Off Valve.

Oil-O-Matic's new Model Fifty-Ten operates at 3450 rpm.

1 When the thermostat is satisfied and the burner shuts off the new hydraulic shut-off valve instantly closes when the motor speed drops to 2800 rpm. Internal air purges the nozzle of oil while the burner "coasts" to a complete stop. This purging prevents any formation of carbon in the nozzle.

2 When the burner starts up the hydraulic shut-off valve remains closed until motor speed is up to 2800 rpm. By then internal air is being delivered through the nozzle. This insures smooth starts and complete, thorough combustion of even the first small delivery of Thrift Metered oil.

Just ONE of the MANY features that make Oil-O-Matic's new—ALL new—Model Fifty-Ten—the Greatest Advance in Oil Heat History!

- NEW** Vair-O-Meter
NEW \$5,000,000 Oil-Air Nozzle
NEW Capacitor-Start Motor
NEW Cushion Coupling
NEW Light weight ONLY 65 lbs.

plus

THE EXCLUSIVE OIL-O-MATIC HYDRAULIC VALVE

IN THE NEW, ALL NEW

MODEL

Fifty-Ten

WILLIAMS

OIL BURNER



LOW PRESSURE

(only 1 to 2 lbs.)
with Sealed Thrift Unit

Burns any kind . . . Yes, any
kind of Domestic Fuel Oil

Pittsburgh Testing Laboratory tests
have proved Oil-O-Matic's ability
to burn either a No. 1 Oil or a
100% catalytically cracked oil
with equal ease and efficiency.

NEW, COMPLETE UNITS for warm air,
steam, or hot water. Featuring
Model Fifty-Ten performance.



NOW MORE THAN
EVER OIL-O-MATIC
DEALERS HAVE
THE INDUSTRY'S
BEST FRANCHISE

A few dealer territories
are available in our expanding
dealer organization.
Write today for all facts.

**WILLIAMS
OIL-O-MATIC
DIVISION**

Eureka Williams Corporation
BLOOMINGTON, ILLINOIS

NEW—SCIENTIFICALLY DESIGNED

Skuttle "WINDMASTER"

BAROMETRIC DRAFT CONTROL!



- BETTER CONTROL
- EASIER INSTALLATION
- MORE PROFIT

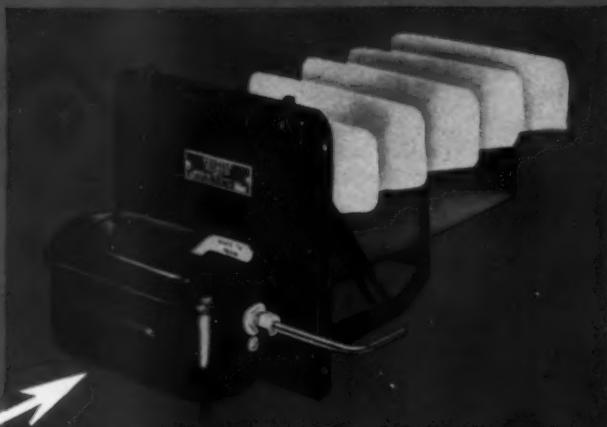
Square housing and patented angle mounted valve provides more uniform opening with larger effective area. Tested characteristics show a flat curve, assuring even, effective control—efficient operation at all draft values. See the test chart—it shows definite superiority.

Exceptional simplicity of design and sturdy construction enable you to offer your customer higher quality at lower cost and better profit.

Installation is exceptionally easy—ask your jobber. Available in 6', 7', 8' and 9' sizes.

**AIR CONDITIONING MEANS
HUMIDIFIED AIR FOR MORE
EFFECTIVE HEATING—SELL
SKUTTLE SERIES 600 HUMIDIFIER**

Comfort—effective heating—demands good humidification. Without proper humidity, a home feels chilly unless over-heated at high fuel cost. Throats get dry and respiratory diseases increase. A humidifier is as necessary as a filter in forced warm air heating. Skuttle Series 600 Humidifier provides better humidification. Self-flushing—self-cleaning—has the patented Vapelite plates that absorb 70% more water. The patented valve has an industry-wide reputation for lasting. Made of copper and brass—it's a quality, trouble-free item. Your jobber stocks Skuttle Humidifiers and Draft Controls.



Skuttle

THE SKUTTLE MANUFACTURING COMPANY • 4099 BEAUFAIT AVENUE • DETROIT 7, MICHIGAN

WHAT OTHER HEATING METHOD

can match
all
THESE
BENEFITS



Dravo Counterflow HEATERS

are today's "Best Buy" in Open-space Heating—

- ★ **LOW FIRST COST** . . . Users report savings of 50% to 65% over standard wet-type systems.
- ★ **WORKING-ZONE WARMTH** . . . Units heat areas of 4,000 to 20,000 sq. ft. each. Roof heat loss greatly reduced.
- ★ **NO FUEL WORRIES** . . . Burn oil or gas—readily converted from one to other.
- ★ **LOW OPERATING COST** . . . 80-85% efficiency at bonnet plus top efficiency in heat distribution holds costs down.
- ★ **AUTOMATICALLY CONTROLLED** . . . On-off or modulating controls. The heater looks after itself—no continuous attention needed.
- ★ **EASY INSTALLATION** . . . Just hook up fuel, electric and exhaust connections—and the heater is ready to go.
- ★ **LONG LIFE—LOW MAINTENANCE** . . . Stainless steel combustion chamber, rugged mill-type construction, top-drawer engineering.
- ★ **TESTED—APPROVED** . . . AGA and/or UL seal on all standard units. Each heater flame-tested at factory before shipment.
- ★ **AVAILABILITY** . . . Heaters are stocked, ready for immediate delivery. No delays.

FOR FULL INFORMATION . . . DROP A CARD
OR A LETTER FOR BULLETIN BC-523-2

DRAGO
CORPORATION
DRAGO BUILDING, PITTSBURGH 22, PA.

Dravo also manufactures the DRAGO CRANE CAB COOLER for air conditioning hot-metal crane cabs.
PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO • ATLANTA • BOSTON
Sales Representatives in Principal Cities • Mfd. and Sold in Canada by Marine Industries, Ltd., Sorel, Quebec





The brand most in demand...

THE U·S·S Trade-Mark is the hallmark of quality throughout the metal-working industry.

U·S·S Galvanized Steel Sheets are especially processed to stand up under severe atmospheric conditions. A tightly adhering coating of zinc which keeps out deteriorating oxygen and moisture makes U·S·S Galvanized Sheets highly resistant to rust and corrosion.

And, being uniform in flatness, surface and ductility, these sheets give true bends, tight seams and neat joints . . . even in forming the most difficult angles and shapes.

It will pay you to get in touch with your nearest sheet metal supplier. If he doesn't have the U·S·S Sheets you want when you inquire, he may have them soon. We are making every effort to keep him supplied with these popular sheets.

CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO

COLUMBIA STEEL COMPANY, SAN FRANCISCO

TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM

UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST

UNITED STATES STEEL EXPORT COMPANY, NEW YORK



U·S·S STEEL SHEETS

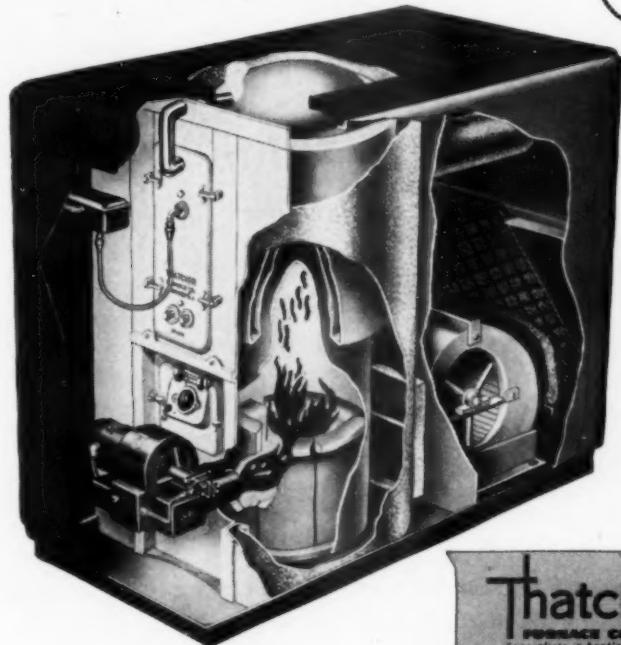
UNITED STATES STEEL

9-903



**Pioneer
in heating
in 1850 . . .**

**Leader
in modern
home comfort
today**



For 99 years in the industry, Thatcher has always been a leader in discovering, developing, and perfecting what's new and better in home heating.

Typical of Thatcher's advanced design is the "V" series Comfortmaster — featured next month in Small Homes Guide. It's a completely automatic, oil-fired winter air conditioner. For the home owner, it's a lifetime investment in carefree comfort.

You'll find superb units for most *every type* of residential heating need in the one Thatcher line. So make a partner of Thatcher's long experience in building modern, trouble-free equipment. Recommend Thatcher—for a minimum of trouble, a maximum of efficiency.

**7 reasons why
it's EASIER TO SELL the
Thatcher "V" series Comfortmaster**

- Flange Mounted Oil Burner
- Modern Maroon and Grey Slip-Joint Cabinet
- Tailor-Made Combustion Chamber
- Automatic Vaporizing Humidifier
- Squirrel Cage Type Blower
- Welded Steel Gas Tight Radiator
- All Parts Easy To Reach



Specialists in Heating since 1850

GARWOOD, NEW JERSEY





"YEP, SON, FOR 15 YEARS I'VE
GIVEN MY CUSTOMERS THIS

CLOSER TEMPERATURE CONTROL*
WITH PENN THERMOSTATS"



"I don't care what words you use to describe the thermostat, I know from my experience in the heating business that the *Penn* folks found out many years ago how to give the close temperature control that spells real heating comfort in all kinds of weather.

"My customers are not plagued with alternate 'cold 70' shivers and overheating, because the Penn thermostat *anticipates* room temperature changes and keeps the burner feeding just the right amount of warmth for real comfort. Furthermore, I've always preferred the simplicity of the two-wire installation, the snap action contact structure and the all-around reliability of Penn thermostats, proved in 15 years of actual operation with every type of heating equipment."

Take a tip from this typical experience of heating dealers—give your customers the comfort, and yourself the satisfaction and profit which the Penn *original heat anticipating thermostat* assures. **Penn Electric Switch Co., Goshen, Indiana.** Export Division, 13 East 40th Street, New York 16, N. Y., U. S. A. In Canada, Penn Controls Ltd., Toronto, Ontario.

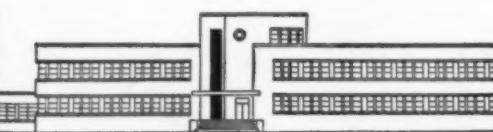


Here's What Penn
Heat Anticipation
Does...

- * Holds the temperature at selected level—within one degree or less;
- * Avoids "cold 70"; ends discomfort of "zig zag" heating.
- * Automatically compensates for outside weather conditions.
- * Provides more frequent, short burner operations instead of longer runs and standby periods, assuring even flow of warmth for greater comfort and fuel economy.

It "hugs" the selected level for closer temperature control

PENN



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, PUMPS, AIR COMPRESSORS, ENGINES, GAS RANGES

N

It's Here: THE FURNACE
OF THE FUTURE!



Now!... a worthy addition to the great WARM MORNING Line... a Package COAL FURNACE with many new, advanced features! A complete, compact packaged unit for quick, easy, low-cost installation. Does triple duty... serves as a gravity or pipeless furnace; a forced air furnace (with or without ducts) or as an all-purpose Space Heater.

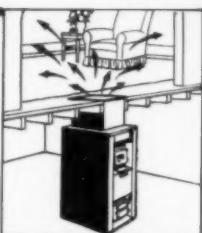
Name Reg. in U.S. and Can. Pat. Off.
**WARM MORNING
COAL FURNACE**

(A Packaged Unit)

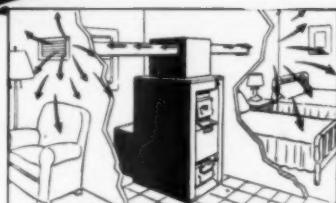
NOTE THESE SALES POINTS: Fuel capacity 100 lbs. Semi-automatic magazine feed... heats 24 hours or more without refueling. Built-in automatic heat regulator. Cabinet of beige brown, Hammertone finish. Exclusive, patented interior construction for more complete combustion and fuel economy. Burns any kind of coal... bituminous or anthracite... coke, briquets, wood. 80,000 BTU output. Heavy firebrick liners in combustion chamber. Ball-bearing grates. Ruggedly built for long service... attractively designed. Blower unit offered as accessory equipment. SEE IT... KNOW ITS MANY OTHER SUPERIOR POINTS!

*WRITE for Illustrated Folder giving detailed information
on this New WARM MORNING FURNACE!*

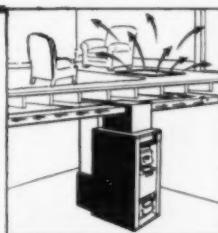
LOCKE STOVE COMPANY
114 West 11th St. Kansas City 6, Mo.



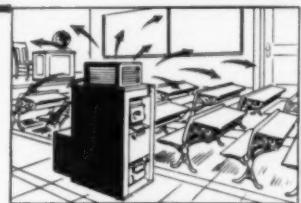
As a Pipeless Furnace
Basement Installation



As a Regular Furnace
Utility Room Installation



As a Regular Furnace
Basement Installation

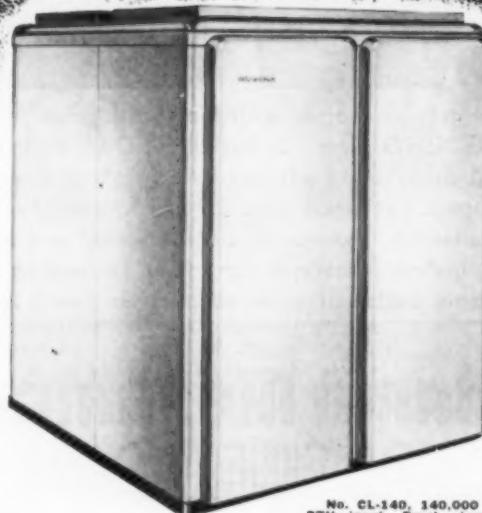


As a Space Heater
for Schools, Churches,
Warehouses, etc.

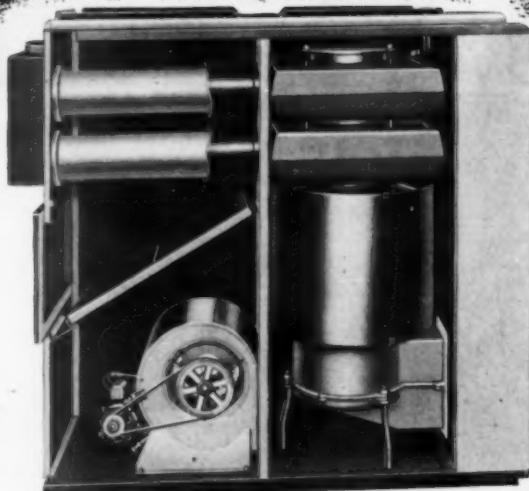
TJF-1

!!! EXTRA CAPACITY !!!

**NOW—Up to 200,000 B.T.U. with
MONCRIEF'S New CAST IRON...GAS FIRED
Air Conditioning Units**



No. CL-140, 140,000
BTU Input. Front view.
Cast Iron Heating Element



No. CL-200 Unit, 200,000 BTU Input Side. In-
terior view, cast iron Heating Element

Here's that extra capacity to get those large, gas fired heating jobs for which the buyer wants a unit with a cast iron heating element.

With the introduction of these larger units, Moncrief can now supply Cast Iron, Gas Fired heating plants with inputs as low as 50,000 BTU and with inputs as high as 200,000 BTU.

Basement Air Conditioning Units, Utility Units and Gravity Furnaces, this series of modern units contains the type and size for every prospective purchaser who demands a heating element of cast iron. And the Moncrief is not just another cast iron furnace to cash in on the present rush for gas fired heating equipment. More than a half century of experience has endowed these "Years Ahead" heating plants with such modern engineering advantages as a round combustion chamber; hori-

zontal joints, that are gas-tight without cement, where radiators join combustion chambers; readily accessible cleanout ports that meet all requirements; and finally a cabinet so ingeniously constructed that the entire heating element can be removed in a matter of minutes without touching ducts or plenum chambers.

Cast Iron, Gas Fired Units are only one member of the large family of Moncrief "Years Ahead" heating products. Coal fired, Gun, Oil Fired, Vaporizing, Oil Fired, Gas Fired—steel or cast iron heating elements—gravity furnaces, air conditioning units, Hiboy units, Counterflow units with air discharge at base of cabinet—Moncrief makes them all.

Send in for catalogs and the name of the Moncrief jobber who can place you in a position to increase your sales and profits.



Series L
Gas-Fired Steel
Air Conditioning
Unit



Series U
Gas-Fired, Steel
Utility Air
Conditioning
Unit



Series P
Gun, Oil Fired, Steel,
Air Conditioning
Units; Made also in
Hiboy and Gravity
Furnace Models.
Convertible to Gas



Series W
Gas-Fired,
Steel
Gravity
Furnace



Series V
Vaporizing Oil-Fired,
Steel Air Condition-
ing Units; made also
in Hiboy and Gravity
Furnace models.
Convertible to Gas



Series AC-700-F
Coal-Fired, Steel
Air Conditioning
Unit



Series 700
Coal-Fired, Steel
Gravity Furnace;
also available
with Round
Casing



Series C
Coal-Fired, Cast Iron
Gravity Furnace; also
available with Square
casing and in
pipeless models

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

MONCRIEF
SINCE 1858

FURNACE PIPE AND FITTINGS



Q

**QUALITY, TOO, IS MORE
THAN SKIN-DEEP**



Weirzin

ELECTROLYTIC ZINC-COATED SHEETS AND STRIP

Conspicuous in its flawless surface is Weirzin's electrolytically deposited coating of malleable zinc. And that's all you're likely to see of Weirzin, for—even after deep drawing—the zinc remains intact, forming an impervious protective coating, safe from underfilm corrosion.

But the quality of Weirzin is more than skin-deep. Beneath its zinc coating is Weirton's own cold-rolled steel, noted for its ductility, uniformity of gauge, and adaptability to drawing and forming operations.

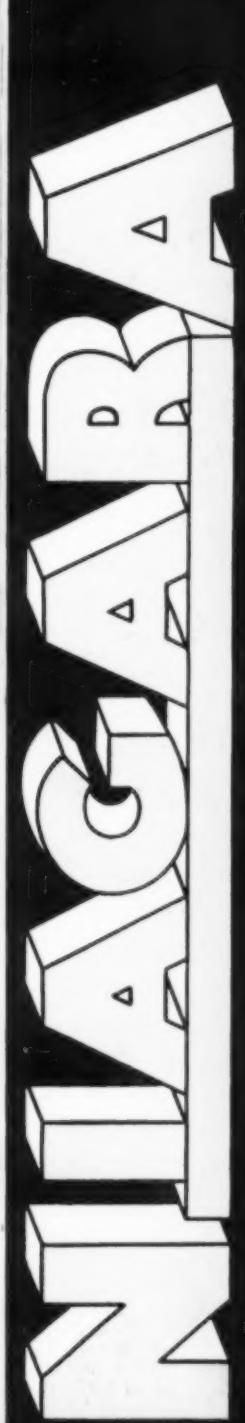
Weirzin, in short, enables you to make better products—and with appreciable manufacturing economies.



WEIRTON STEEL CO.

WEIRTON, W. VA., Sales Offices in Principal Cities

Division of NATIONAL STEEL CORPORATION, Executive Offices, Pittsburgh, Pa.



PRESENTS A COMPLETE

new

LINE OF ULTRA-MODERN
FOOT SHEARS

with A SIZE TO FIT YOUR REQUIREMENTS

30 inch through 6 foot—16 gauge
8 and 10 foot—18 gauge



- Pick your foot shear from this complete new Niagara line. Check all their advanced and exclusive engineering features.

Distinctive Styling. Easy, Lively Operation. Accurate Cutting. Clear Visibility of Cutting Line. Unbreakable Steel Construction. Strength and Stiffness. Light Weight. Lifetime Bronze Crosshead Ways and Treadle Bearings. Niagara Alloy Tool Steel Knives. Quick-Acting Back Gauge and Convenient Front and Side Gauges.

Write for data.

NIAGARA MACHINE & TOOL WORKS · BUFFALO 11, N.Y.
DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT



I sell the Complete

VICTOR

HEATING EQUIPMENT LINE
because . . .



COAL



COAL



OIL



HI-BOYS



GAS



BLOWERS



BURNERS
& ALL
ACCESSORIES



It's the furnace

WITH FUEL

SAVING



Write Us Today!

**Investigate the Complete VICTOR
COAL • GAS • & OIL LINE**

I get the **complete** Victor line from Hall-Neal. All of the equipment I need for a job comes from **one** company... a full range of sizes in gas, coal, or oil furnaces; blowers, controls, registers, humidifiers, and accessories. It all fits together right—it works right for years to come. I sell more than just heating equipment; I sell VICTOR winter comfort . . . which means a lifetime of heating satisfaction.

**It pays to deal with
ONE ORGANIZATION
handling a Complete
Line . . . because**

**your orders
are handled at
the**

ONE STOP

HALL-NEAL FURNACE CO.

VICTOR Quality Furnaces Since 1890

1322-1332 N. CAPITOL AVENUE - INDIANAPOLIS 7, INDIANA



Heating contractor bids for store traffic with attractive, single-line window.

WINDOW WISE IS DOLLAR WISE

WINDOW WISE IS DOLLAR WISE

Your windows need not face State Street or Fifth Avenue to be productive, profitable and worth considerable time and attention. All street traffic is important, and the better your windows, the more people you'll bring into your store to shop, to buy. Your windows are constant, low-cost advertisements. To make them really productive all you need is merchandise, display material, some fresh paint — and if possible, some sales idea or motif. The cost of doing the job is very little, and pays a handsome profit.



When prospect pushes a button this animated electric display shows complete operation of Field Safety System.

PICK TRAFFIC MERCHANTISE

Include in your display some low-cost accessories, on attractive display boards, to pull traffic into your store. Typical good merchandise: The various, low cost Field control systems — including Barocheck (combination draft control and check damper), the Field Safety Control, and the Field Fuel Saving System for automatic control of hand-fired furnaces. Prices range from about \$4.95 up. Attractive displays are available for each of these controls.

FIRST IMPRESSIONS COUNT

A prospect entering your store will always notice your window. It is part of the total impression you make on him. An interesting window, holding good product displays, low prices featured, built around a sales idea — that's the rule for success with big volume retailers. Get those attractive manufacturers' displays, use them, and watch store traffic increase. A main street location helps, of course, but a good window display does a selling job in any location.

Attractive display provided by Field Control Division holds their new Safety Control. This control automatically closes dampers when bonnet temperature gets too high.

Field
means finest in
DRAFT CONTROLS
... And There's A Field Control For Every Need!

field
TYPE
M

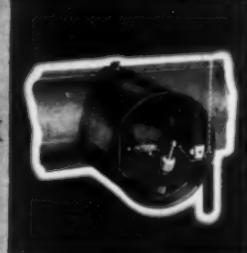


First and finest for all types of automatic heating equipment.

field
TYPE
R

First and finest for all types of space heaters and ranges.

field
BAROCHEK



First and finest for hand-fired furnaces and boilers, a combination check damper and barometric draft control.

field FUEL SAVING SYSTEM

A newer, finer, more trouble-free damper-motor set with automatic spring return, built-in limit controls, "stoke-switch", and booster fan switch.

WRITE for proof of why Field Is First and Finest — first choice for the finest in heating equipment.

field CONTROL DIVISION
H. D. CONKEY & CO., MENDOTA, ILL.
AFFILIATES:
Conco Building Products, Inc.
Brick - Tile - Stone
Conco Materials Handling Division
Cranes - Hoists



Here's the neat-looking job you deliver in less time at lower cost — with Mueller Climatrol Patented Fittings to reduce trunk size and eliminate special fittings.

Comparison of Mueller Patented Takeoff (at left) with typical standard takeoff. The saving in size, metal, and extra fittings is obvious.

Mueller Climatrol patented fittings

cut inventory investment — job time — material costs

Why make your own pipe and fittings, when the complete Mueller Climatrol line offers so many advantages? You can concentrate your man-hours on profitable installations, handle each job faster, more jobs per season. And you don't have to worry about complicated estimates, uncertain costs, and "tricky" balancing!

Complete stocks of every fitting you'll need are available at all times. Absolute uniformity assures quick erection and neat, compact jobs.

CHCK these time- and money-saving advantages of Mueller Climatrol patented fittings:

- ✓ Patented take-off reduces trunk-size from 6 to 10 inches at plenum on average installation.
- ✓ Smaller trunk size cuts job time, material costs — makes balancing fast and simple.
- ✓ Eliminate need for increasers, and other extra fittings.
- ✓ "Standardized" costs increase your profits.
- ✓ Conform to simplified practice recommendations of U. S. Bureau of Standards.
- ✓ Also a complete line of duct and fittings for extended plenum systems.

MUELLER
Climatrol

REG. U. S. PAT. OFF.
Tear out this coupon and mail today! Ask your jobber!

L. J. Mueller Furnace Company
2010 W. Oklahoma Avenue, Milwaukee 4, Wisconsin
Rush a copy of your new Furnace Pipe and Fittings Catalog.

D-99

Name _____
Company Name _____
Company Address _____
City _____ (.....) State _____

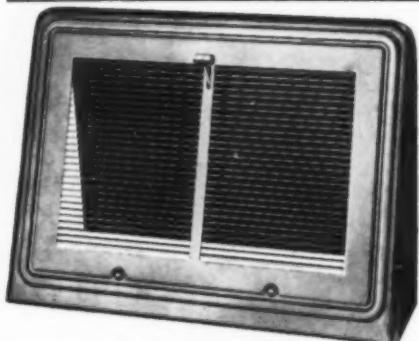
Just off the press





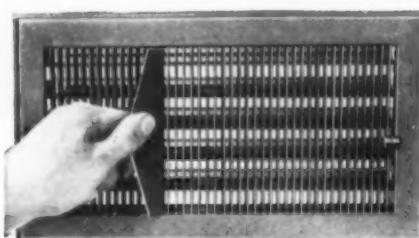
"Now's the Time"

You can again get prompt delivery
of the superior quality U. S. lines



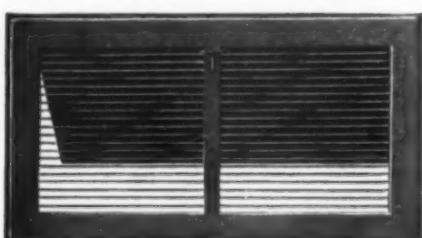
No. 40 Series GRAVITY BASEBOARD REGISTERS

The Most Perfect Baseboard Register ever designed—for Beauty, Versatility, and Practical Installation Economy. Of Two-piece construction—with Removable Grille which attaches to the baseboard frame with patented Turn-buttons instead of easy-to-lose screws. Make all the comparisons you want, there is nothing that excels the No. 40.



No. 256 4-way FLOW A-C REGISTERS

Smartly modern . . . easily installed . . . reasonably priced . . . No. 256 is the last word in Air-Conditioning Registers. It works perfectly installed in any location—sidewall or ceiling—with any style of stackhead and air-flow from any direction. It provides full control of directional-flow with its sturdy, bendable, grille bars and back louvres.



No. 153 Air Conditioning REGISTERS

Price can be kept down and customers still given a good-looking job by installing No. 153 Registers. Grille bars are adjustable and hide the register interior—an important factor for lasting customer satisfaction. The No. 153 is trim and neat in appearance—not a MERE stamping—but a QUALITY register THROUGH and THROUGH.

NEW! Did you get your copy of the new U. S. No. 50 Pocket Manual? IT'S HANDY . . . YOU NEED IT . . . WRITE FOR IT TODAY! Also let us know if you want catalog U. S. 41-F on Gravity and Air-Conditioning Pipe and Fittings.

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY
SOLD BY LEADING JOBBERS FROM COAST TO COAST

demand
DETROIT CERTIFIED CONTROLS



*designed right
built right
proven right*



When you install **DETROIT** Certified Controls you are providing your customers with the best in control equipment. **DETROIT** Certified Controls are designed and built to fit your customer's needs—giving real economy and reliability through years of trouble-free service. This is true of the entire **DETROIT** line, one of the most complete in the heating field. Add to this the fact **DETROIT** has been famous for quality for over 70 years and you have

an unbeatable combination. But **DETROIT** goes even further, certifying every control in its line—backing you, your work and your reputation. For helpful information on ordering and installing **DETROIT** Certified Controls, on oil and gas heating units, send for the colorful **DETROIT** Catalogs today.



CRC-433

CRC-433 Fuel Transfer Pump—Used in combination with Detroit Float Valves and Furnace Controls to provide automatic fuel supply from remote tanks to vaporizing burners. Motor driven vane pump gives quiet and trouble-free service. Write for Bulletin No. 218.

CRC-239-FF Furnace Control—Regulates flow of oil to vaporizing burners. Provides 2-speed draft fan control; reduced draft for low fire, full draft for high fire. Used with the No. 411 Thermostat to automatically maintain uniform room temperature. Other models available with or without draft fan control. Write for Bulletin No. 222.



CRC-239-FF

DETROIT HEATING AND REFRIGERATION CONTROLS • ENGINE SAFETY CONTROLS • FLOAT VALVES AND OIL BURNER EQUIPMENT • DETROIT EXPANSION VALVES AND REFRIGERATION ACCESSORIES • STATIONARY AND LOCOMOTIVE LUBRICATORS

DETROIT

LUBRICATOR COMPANY

5900 TRUMBULL AVE., DETROIT 8, MICHIGAN

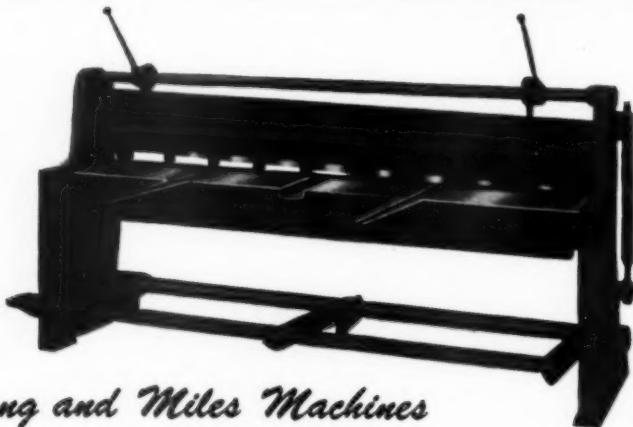
Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

CANADIAN REPRESENTATIVE: RAILWAY & ENGINEERING SPECIALTIES, LTD.—MONTREAL, TORONTO, WINNIPEG



Serving home and industry AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON

For SHEAR Satisfaction



Install these Wysong and Miles Machines



BETTER ROLLS

FEWER PASSES — LESS EFFORT — Smooth high carbon steel rolls for accurate forming. Circular grooves for wired edges. Quickly adjusted for clearance and radius. 100% jig and fixture construction.

AT LOWER PRICES

MACHINE NUMBER	DIAMETER OF ROLLS	LENGTH OF ROLLS	PRICES
230	2"	30"	\$ 80.00
236	2"	36"	\$ 85.00
242	2"	42"	\$ 90.00
836	2½"	36"	\$177.00
842	2½"	42"	\$210.00
848	3"	48"	\$357.00

POWER MODELS—5" Rolls in 48", 60" and 72" lengths.

HANDLED BY LEADING DEALERS
Coast-to-Coast

STURDIER CONSTRUCTION

Greater weight, properly distributed for more efficient shearing. 35% steel castings for greater strength and rigidity. Adjustable gauges, positive holdown and proper leverage for accurate, clean cuts and easy operation.

EXPERTLY BUILT

By skilled workers who know how much the right kind of shearing simplifies succeeding operations. Ways are hand scraped and each part is accurately fitted.

AMAZINGLY LOW PRICES

MACH. NO.	CAPACITY	WEIGHT	PRICE
1830	18 gauge	700 pounds	\$200.00
1630	16 gauge	875 pounds	\$250.00
1836	18 gauge	800 pounds	\$225.00
1636	16 gauge	975 pounds	\$278.00
1642	16 gauge	1150 pounds	\$330.00
1648	16 gauge	1250 pounds	\$360.00
1652	16 gauge	1375 pounds	\$390.00
1672	16 gauge	2600 pounds	\$630.00
1896	18 gauge	3600 pounds	\$890.00

Prices quoted are F.O.B. Greensboro, N. C.

POWER MODELS—10 ga. in 6, 8, and 10 ft. lengths. 3/16"x96". 1/4"x72". 12 ga. in 52", 72" and 96" lengths. 14 ga. x 72".

Also air-powered shears up to 8 ft.

ASK YOUR DEALER OR WRITE FOR
CATALOGUE NO. 22-A

WYSONG and MILES CO.

GREENSBORO,
NO. CAROLINA

Sell the MODERN Kaustine Winter Air Conditioner

Complete Packaged Unit Assembled at Factory

FOR EASIER SALES... MORE PROFIT

Check the features of these two *modern* Kaustine Winter Air Conditioning Units. They are engineered to the needs of the small home owner . . . and made to order for *your* sales needs in today's competitive market. Their smart, modern appearance and features that are usually found only on higher priced units make them easy to sell. The ease and speed with which they can be installed means more profit for you on every installation. The satisfaction they give means more sales without sales effort on your part. Kaustine is the real profit line for Fall heating sales.

BURNS THE TOUGH
CATALYTICALLY CRACKED OILS

KAUSTINE

065 "R" HB (High Boy)

For the utility room in the small home . . . for basement use, or as a pipeless furnace . . . for garages, gas stations, small shops.

65,000 BTU at the bonnet with .65 nozzle. Takes minimum floor space, 24½" wide by 31½" deep. Filters can be interchanged from right to left side in a minute and a half for easier installation. No cutting or patching. Chrome steel fire pot liner. 9" blower. Warm air outlet 14"x23½". Economizer of improved streamline design extracts extra heat from flue gases. "Air Way" designed combustion chamber. 6" flue stack.



KAUSTINE

095 LB (Low Boy)

The oil-fired Air Furnace "De-signed" for Today's Homes.

95,000 BTU at bonnet with .85 nozzle. Floor space 24½" wide by 49¾" deep. Only 46" high. 20" by 24" air filter. 10" Chrome steel firepot. 9" blower. Cold air inlet and warm air outlet located in top of furnace casing, each 18" wide by 15" long. Large float type pan humidifier. Has Economizer and "Air Way" combustion chamber. 6" flue stack.

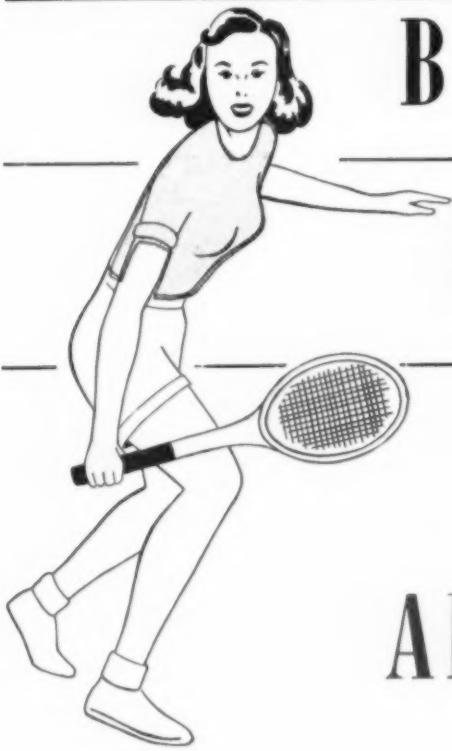
Send for your supply of this helpful home-owners book—*"How to Choose a Winter Air Conditioning System."*



Kaustine
COMPANY INC.
PERRY, NEW YORK

BACKED BY NATIONAL ADVERTISING
... BY MORE THAN 34 YEARS SERVICE
TO THE AMERICAN HOME OWNER

MODULATING WARM AIR FURNACES . . . SEPTIC TANKS . . . SEPTIC SEWAGE DISPOSAL EQUIPMENT . . . METAL TILE CONNECTORS . . . OIL AND GASOLINE STORAGE TANKS . . . HYDRO-PNEUMATIC AND WATER STORAGE TANKS . . . PRESSURE VESSELS . . . TRUCK TANKS . . . CUSTOM BUILT FABRICATED EQUIPMENT . . . TRANSFER PUMPS



B E A U T I F U L D U R A B L E



AIR CONDITIONING FITTINGS

MODERN DESIGN AND
MANUFACTURE BRING YOU
THE *World's Finest!*



End View of
One-Piece
Snap Lock Cleat



DEALERS...

Investigate the complete
ADELTA line of Air
Conditioning Ducts and Fittings

Send for catalog today.

*Sold through leading jobbers
everywhere.*

*Also manufacturers of a
complete line of furnace
pipe and fittings.*

ADELTA MANUFACTURING CO. INC.

21st and Ellsworth Sts., Phila. 46, Pa.



A New High in Performance! A New Low in Price!

Two New MOR-SUN Gravity Gas* Furnaces



Completely equipped with solenoid valve and safety pilot, pressure regulator, main shut-off and pilot shut-off valves, thermostat and draft diverter, the MOR-SUN gas gravity furnaces — completely automatic.

Now, the manufacturers of MOR-SUN pressed steel gas-fired and oil-fired winter air conditioners, the world's finest and most beautiful forced warm air furnaces, present *two new gas-fired GRAVITY furnaces!*

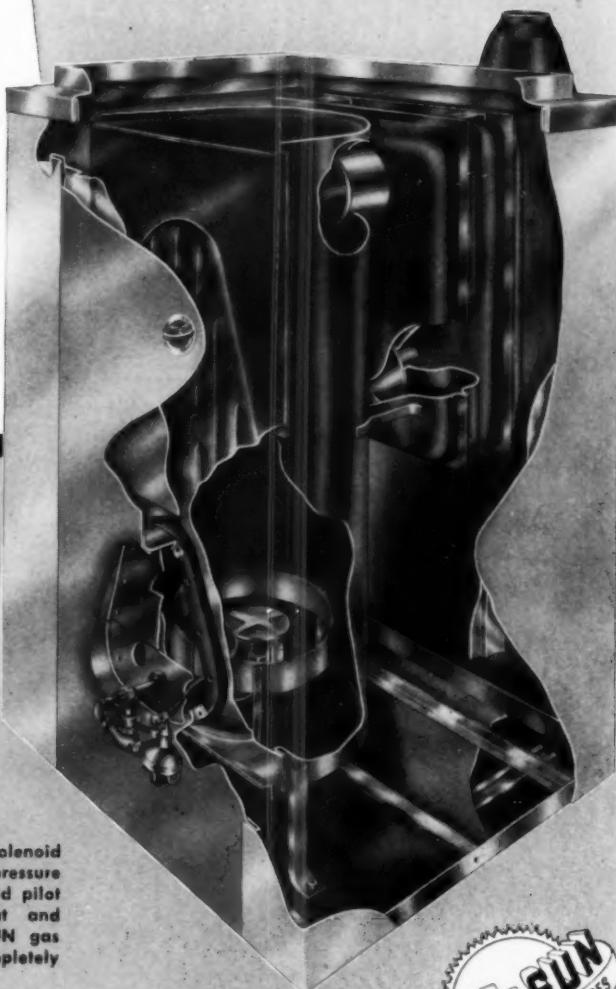
These new GRAVITY all-steel furnaces — GR-2-G (BTU input 80,000, Bonnet output 60,000) and GR-3-G (BTU input 110,000, Bonnet output 82,500) present *new highs in performance and new lows in price!*

Mass-precision-produced, the efficiency and beauty of these gas gravity furnaces are made possible by elaborate dies, designed and manufactured in the Morrison plant. The heat exchangers are pressed of heavy gauge steel — die-stamped to give maximum heating surfaces — completely welded units — permanently sealed! The casings are finished in beautiful grey hammerloid.

The exclusive design and all-welded construction of the combustion chamber make available for the first time *low cost home heating* — new economy, new efficiency, new beauty!

The MOR-SUN Gas-Fired Gravity Furnaces are completely assembled and packaged at the factory — ready for easy quick installation.

*A.G.A. Approved.



"The Sun Never Sets with MOR-SUN!"

WRITE, WIRE, PHONE FOR SPECIFICATIONS and PRICES.

MORRISON
STEEL PRODUCTS,
INCORPORATED

BUFFALO 7, NEW YORK

CONVERTING YOUR FURNACE or BOILER TO GAS HEAT?

*Better Buy
by Comparison*

A black and white sketch of a man with dark hair and a mustache, wearing a suit jacket, white shirt, and tie. He is seated on a simple wooden chair, facing right towards a front-loading washing machine. The machine has a control panel with several rectangular buttons. A small dog is visible inside the open door of the washing machine.

There's a Janitrol Conversion Burner for every type of furnace or boiler.

BUYER'S CHECK LIST

- BUYER'S CHECK LIST**

 - ✓ **THE MANUFACTURER** Make sure you buy a burner designed and built by a well established manufacturer. A good burner will serve you many, many years, so assure yourself of dependable service.
 - ✓ **THE PRODUCT** Surface Combustion conversion burner. Fully automatic gas dependable installations give testimony to your neighbor has a Janitorial system to do the cleaning. Only talk to him who is experienced in gas heating qualifications. You can be sure he makes Janitorial installations up to the factory's high work standards.
 - ✓ **SPECIFICATIONS** Your burner is listed by A.G.A. Look for modern design features. Dependable positive pressure type pilot. Demand Push-button lighting control. Motorized Air Control. Positive pressure heating package. Be sure you get a complete burner assembly at a reasonable price. Your Janitorial dealer can show you a well designed and operating features that make your burner best.



THE BURNER WITH THE DUAL FUELS

One of many Janitrol firsts! This improved combustion principle produces a flame within a flame. With the outer flame enveloping the inner flame, it can't be blown out; combustion is continuous and highly efficient . . . the burners go out and heat controls require it.

The famous Janitrol Conversion Burner is a result of more than thirty years experience devoted exclusively to the design and building of gas heating and

treating equipment...your guarantee that Janitoril in addition to being the most modern, is also dependable and efficient. You can shop around for a cheap gas burner but remember first cost is not the last with cheap equipment that costs more to re-gain and operate.

See your Janitrol Dealer first.
He's listed in your telephone
directory under Furnaces—
Janitrol Heating Equipment.
Surface Combustion
Corporation, Toledo, Ohio.

Janitrol
TIME-TESTED TIME-PROVEN GAS HEATING

This advertisement in two colors appears in the September Issue of Better Homes & Gardens

Why we say:

"JANITROL IS EASIER TO SELL THAN SELL AGAINST"

We didn't invent the phrase above. It's a statement made time and time again by successful Janitrol dealers. At a recent dealers meeting we were told: "Help us find the prospects, we'll sell them," "We can outdemonstrate, outsell any burner on the market," "We lose very few prospects after they compare Janitrol with other equipment."

Don't delay, find out today how you too can profit from the nationally advertised Janitrol Conversion Burner line. Learn why Janitrol Burners outperform, outsell others.

Write now and we'll arrange for a district Surface Combustion representative to show you why "Janitrol is Easier to Sell than Sell Against."

SURFACE COMBUSTION CORPORATION, TOLEDO, OHIO

● Unrivalled Consumer Acceptance ...

**● Proven Performance
on All Types of City Gas ...**

● **Factory Supervised Sales
and Service Training . . .**

● More Easily Demonstrated
Sales Features . . .

● Competitively Priced . . .

● Nationally Advertised...

● Complete Dealer
Identification Program . . .

**● Planned and Coordinated
Sales Helps ...**

Janitrol

How would you build a two-acre roof?



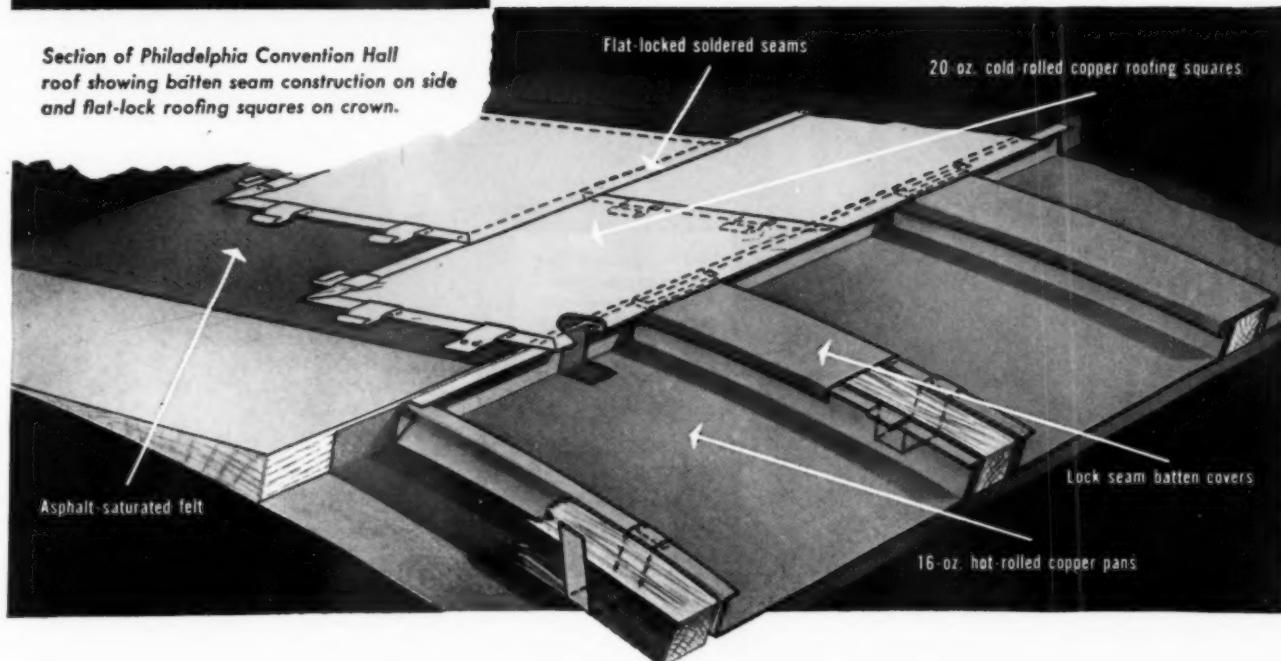
Section of Philadelphia Convention Hall roof showing batten seam construction on side and flat-lock roofing squares on crown.

You would build it of copper if you wanted the easiest and most practical roofing metal to install. So, Anaconda Sheet Copper was chosen for reroofing 90,000 square feet atop the famous Convention Hall in Philadelphia.

Here, for the first time, was incorporated the new principle of using cold-rolled copper for all soldered work—in gages and forms corresponding to the nature and scale of the job. Cold-rolled copper offers greater stiffness to resist buckling and thereby transfers stresses to the expansion battens and slip joints.

Anaconda Sheet Copper has stood the test of time. It's the roofing metal of first choice for appearance, low maintenance and resistance to corrosion. Let our Technical Department help you with any roofing or sheet metal problems involving copper or its alloys. Just write to The American Brass Company, Waterbury 88, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

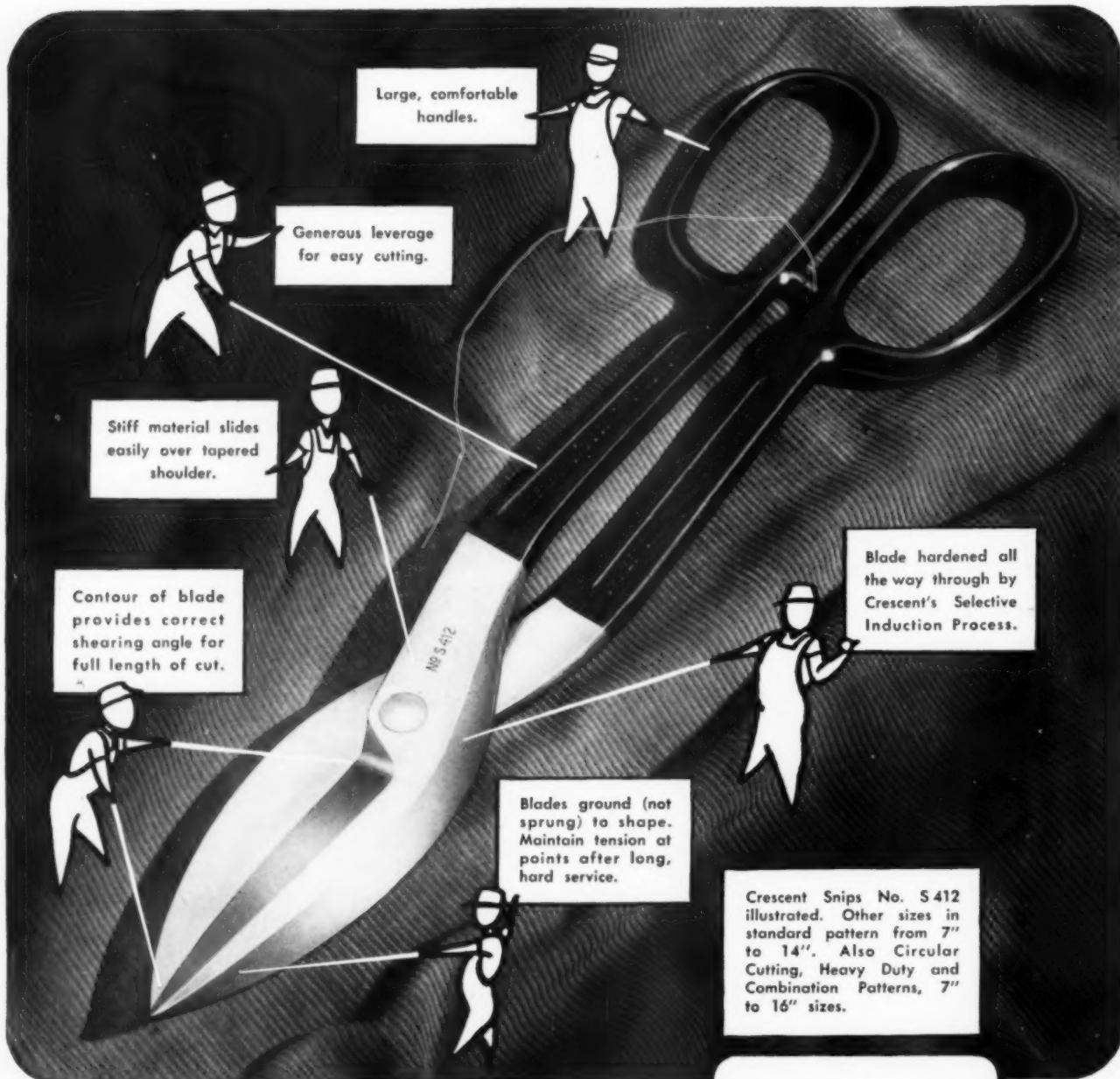
4384



You can build it better
with *Anaconda Copper*

**CRAFTSMEN
RECOGNIZE
QUALITY**

} by these fine features in
TINNER'S SNIPS



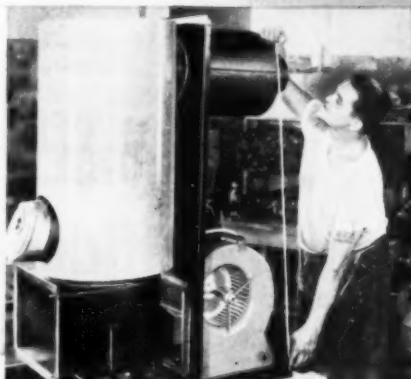
**EVERYBODY
RECOGNIZES
QUALITY**



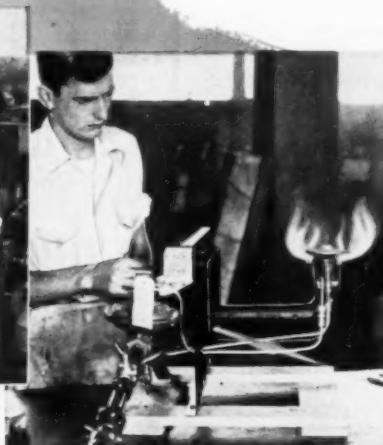
"Crescent" is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by
CRESCEANT TOOL COMPANY, JAMESTOWN, NEW YORK



Peter Loch has been working with sheet metal for 31 years. Pete checks the work of the sheet metal department against specifications. His years of experience have made his checks exacting. Not until he is satisfied that original specifications have been met—does the unit go on to the assembly line.



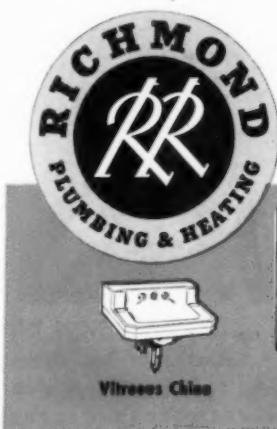
Robert Kleiman, a line inspector, supervises the assembly of the various parts of the heating unit. He makes sure each element is in its proper position and thoroughly secured in place. For years Kleiman has been on the line—checking his assemblies—and passing them on for enamel jackets.



Paul Simon is testing the gas burner for the AS23. Each burner, oil or gas, is completely tested and thoroughly checked. They are checked for fuel leaks, electrical connections and control operation. Not until this careful test is completed and passed is a burner released for shipment with the furnace.



Elwood McCabe, who adds 6 years as aviation metalsmith for the Navy to his years on the Richmond line, is a final assembly inspector. Completely assembled furnaces, with their gleaming enamel jackets, are critically examined by McCabe. He makes sure every detail is perfect and that the furnace is ready for shipment.



Vitreous China



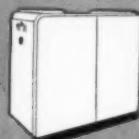
Gas Boilers

RICHMOND

RICHMOND RADIATOR CO.—AFFILIATE OF REYNOLDS METALS CO.



Enamelled Cast Iron Ware



Water Air Conditioners
Gas—Cast iron or steel
Oil—Steel



See your wholesaler or Mail Coupon Today:

Richmond Radiator Company
19 East 47th Street,
New York 17, N. Y.

AA-9

Please send me the latest literature and information on the Richmond line of heating equipment. No obligations, of course.

Name.....

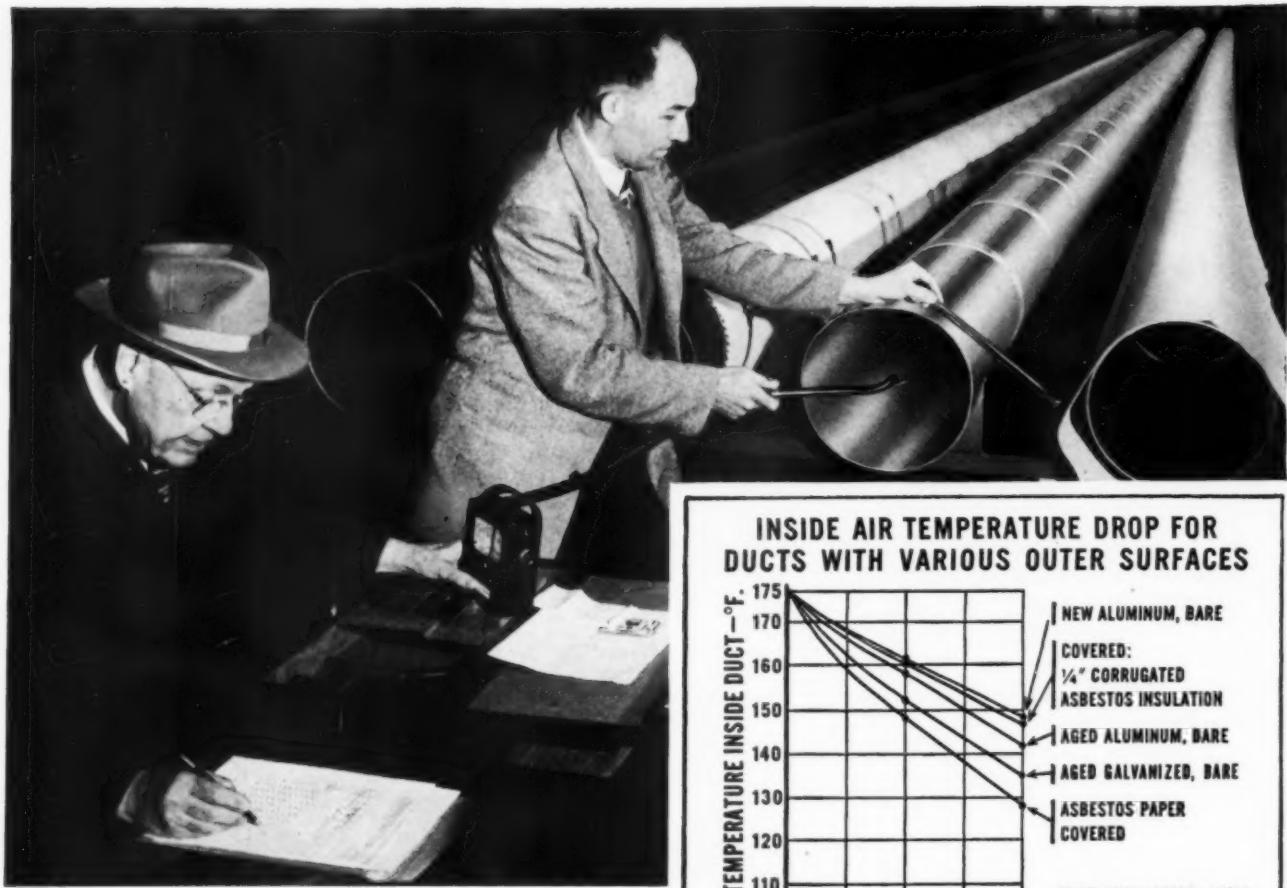
Company.....

Address.....

Putting the Heat on a Furnace!

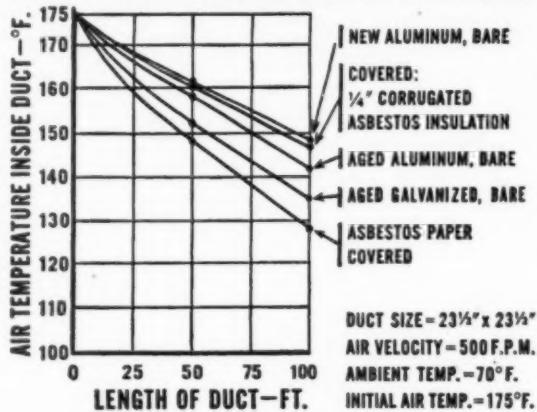
MAKING IT HOT FOR FURNACES IS AN OLD STORY WITH JOHN VEN DOUERN, Chief Assembly Line Inspector for Richmond's New Castle, Delaware, plant. During his 15 years on assembly lines, quality control has become second nature with him. Every step in furnace production, from initial die-cut sheet metal fabrication to final assembly, is under his watchful eye. Shown with him are some of the men who put quality on the line at New Castle.

As a result of close personal inspection and supervision, all Richmond heating units are guaranteed against defective workmanship or material. Also, all units are guaranteed to develop their published ratings—gas units in accordance with the American Gas Association Code—the oil units in conformance with Commercial Standard CS104-46.



UNIVERSITY SCIENTIST and heating engineer record data during practical tests of various materials which show ducts of Kaiser Aluminum economically deliver more heat per B.T.U. input than other ducts.

INSIDE AIR TEMPERATURE DROP FOR DUCTS WITH VARIOUS OUTER SURFACES



Tests prove Kaiser Aluminum ducts more efficient!

They deliver 5 to 30 per cent *more* heat than ducts of other materials, due to reduced surface radiation loss.

These facts were proved in recent impartial tests conducted by Aladdin Heating Corporation, Oakland, under the direction of a Professor of Mechanical Engineering and a Research Engineer of a major U. S. university.

Here's how:

Four round ducts of identical size, but of different materials, were set up side by side. Intake air temperature

was 175° for all. But at 100 feet, delivered air temperature varied from 128° to 147°—because of difference in radiation losses from the surfaces.

On the right, above, is a graph showing results. It's proof that light weight Kaiser Aluminum, because it needs no insulation, actually costs less to install—and makes more efficient use of fuel!

On your next job, be sure to recommend tough, rustproof, easy-to-handle Kaiser Aluminum—the material that offers low operating costs!

Permanente Metals

PRODUCER OF

Kaiser Aluminum

SOLD BY PERMANENTE PRODUCTS COMPANY, KAISER BUILDING, OAKLAND 12, CALIFORNIA . . . WITH OFFICES IN:
Atlanta • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit • Houston • Indianapolis • Kansas City • Los Angeles
Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Portland, Ore. • Seattle • Spokane • St. Louis • Wichita
EXPORT OFFICE, OAKLAND, CALIFORNIA • WAREHOUSE DISTRIBUTORS IN PRINCIPAL CITIES
Corp., 1949, Permanente Metals Corp.

Combustioneer

PAYS YOU BIGGER PROFITS WITH ITS COMPLETE LINE

You can solve almost every coal heating problem, and make a bigger profit for yourself, with Combustioneer's complete line. For any installation . . . from the small home to the large industrial plant . . . there's a Combustioneer model that's sized right, designed and built, for that particular service. Hopper-feed or bin-feed, burning 15 to 1000 lbs. per hour . . . you'll be able to equip homes,

factories, stores, theaters, hotels, apartments, public or other buildings with a Combustioneer Automatic Coal Stoker.

We'll Help You Sell

Combustioneer's merchandising plan includes catalogues, folders, post cards, sales letters and many other sales helps for all kinds of prospects. Newspaper advertising is supplied on a 50-50 cooperative plan. Our field men assist you with sales and heating

problems. Our factory schools train your salesmen and service men.

Write Today...for Profits

We offer you an exclusive Combustioneer franchise. All Combustioneer profits in your territory . . . and they'll be big profits . . . will come to YOU. Write us now, today, for full details of the Combustioneer Franchise and Sales Plan that will help you close heating prospects, help you make more money!



Combustioneer

AUTOMATIC COAL STOKER

THE STEEL PRODUCTS ENGINEERING CO., SPRINGFIELD, OHIO



The Steel Products Engineering Co.
1227 W. Columbia Street
Springfield, Ohio

Please send me, without obligation, full details of
your Combustioneer Franchise.

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____



People Want Automatic Heat

and the New 

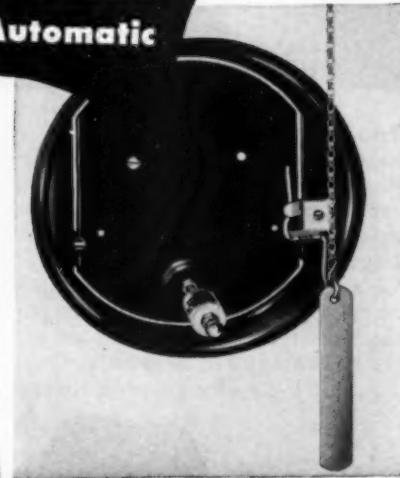
COMFORT MASTER

Makes Their Present Coal Heat Automatic

The  COMFORT MASTER Fuel Saving System is the only low-cost method of giving owners of hand-fired furnaces all the comforts they'd enjoy with fully automatic heat. And it cuts their fuel bills 22½% or more!

The new A-P COMFORT MASTER consists of a sensitive thermostat, a combination limit control and damper regulator with the stoke switch that "remembers," and the fully patented fuel-saving "Field Barometric Draft Control." You can install the entire system quickly and easily, so your customers actually *pay less* than the installed price of competitive units. And in addition to automatic control for greater comfort they get extra years of service from furnaces and pipes. The scientific "Field Barometric Draft Control" ends the possibility of warped or cracked firepots, of smokepipe galvanizing flake-offs. It keeps chimney drafts under constant control, prevents dangerous overheating.

By every test of comfort, economy and DEPENDABLE operation, the A-P COMFORT MASTER is a profit maker and goodwill builder for you. Write for the complete details, and plan to tell your customers you're ready to modernize their coal-burning systems.



AUTOMATIC PRODUCTS COMPANY

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DEPENDABLE
Controls

FOR HEATING . . . AIR CONDITIONING . . . REFRIGERATION

GOT AN
INVENTORY
PROBLEM?



Call us!

SYMBOL OF SERVICE
FOR STEEL USERS



YOU can avoid unbalanced inventories as well as losses due to price declines and obsolescence by ordering your steel from us, as you need it. You can save on space and handling costs, too.

Warehousing complete stocks of steel products is our business and today we can supply promptly, from our large stocks, items needed to balance your inventories. Our mod-

ern warehouses, located strategically for prompt deliveries coast-to-coast, are equipped with the most up-to-date machinery for the speediest cutting, processing and handling of steels.

So—"Call Us"—when you need steel, metal-working machinery, tools, supplies and aluminum. Your orders, large or small, will receive prompt, courteous attention.

UNITED STATES STEEL SUPPLY COMPANY

Warehouses: BALTIMORE • BOSTON • CHICAGO

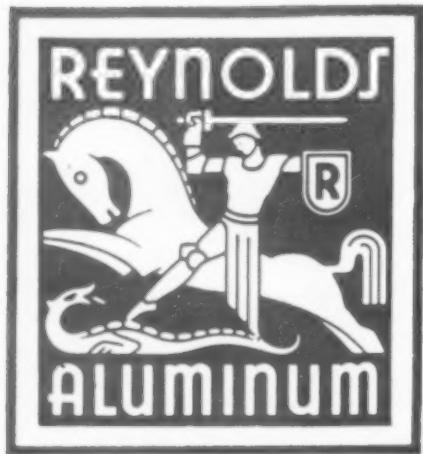
CLEVELAND • LOS ANGELES • MILWAUKEE • MOLINE, ILL. • NEWARK • PITTSBURGH

PORTLAND, ORE. • SAN FRANCISCO • SEATTLE • ST. LOUIS • TWIN CITY (ST. PAUL)

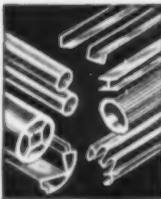
Also Sales Offices at: KANSAS CITY, MO. • PHILADELPHIA • TOLEDO • TULSA • YOUNGSTOWN

Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

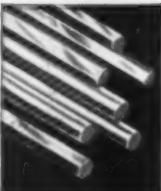
UNITED STATES STEEL



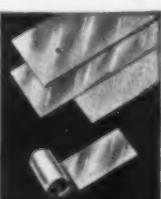
Wire, Rod
and Bar



Extrusions
Structural



Screw Machine
Stock



Coil, Sheet, Plate
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DISTRIBUTORS of REYNOLDS ALUMINUM

REYNOLDS METALS COMPANY • LOUISVILLE 1, KENTUCKY

OFFICES IN PRINCIPAL CITIES • LISTED UNDER "ALUMINUM" IN YOUR CLASSIFIED PHONE BOOK

FAST SERVICE FROM DISTRIBUTOR WAREHOUSE STOCKS

Aluminum in less-than-carload lots is available with speed and with many helpful services from the qualified metal distributors listed below. Reynolds technicians, in offices across the country, work closely with these distributors on special problems. Together they can bring all the advantages of Reynolds *Lifetime* Aluminum to your products and production, just as they are helping metal fabricators everywhere in their conversion to this modern, lightweight metal.

Consider aluminum . . . consult your Reynolds Distributor.



REYNOLDS DISTRIBUTORS HAVE ALUMINUM MILL PRODUCTS FOR IMMEDIATE DELIVERY FROM WAREHOUSE STOCKS

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Arnold-Brown Metals & Supply Co.,
Birmingham 5

CALIFORNIA

American Brass & Copper Co.,
Oakland 7
(Wire, rod, bar, structural only)

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Los Angeles 46

Tay-Holbrook, Inc., San Francisco 1
United States Steel Supply Co., Los
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Western Metal Supply Company, San
Diego 12

COLORADO

Marsh Steel Corporation, Colorado
Springs and Denver 5

FLORIDA

Horne-Wilson, Inc., Jacksonville 6,
Orlando, Miami 36 and Tampa 1

IDAHO

Idaho Steel Products, Inc., Boise

ILLINOIS

United States Steel Supply Co.,
Chicago 4

Benjamin Wolff & Company, Chicago 36

INDIANA

Brass & Copper Sales Co.,
Indianapolis, 4

LOUISIANA

Stauffer, Eshleman & Co., Ltd., New
Orleans 1

MARYLAND

Clandenin Bros., Inc., Baltimore 2
(Wire, rod, bar, structural only)

Lyon, Conklin & Co., Inc., Baltimore 30

MASSACHUSETTS

Bay State Refining Company, Chicopee
Falls (Ingots only)

Arthur C. Harvey Company, Boston 34
Prest & Inman, Worcester 8
(Wire, rod, bar, structural only)

MICHIGAN

Kaslo Steel Corporation, Detroit 9

MINNESOTA

Newell T. Miner Company, St. Paul 4

MISSOURI

Brass & Copper Sales Co., Kansas
City 6 and St. Louis 3

Marsh Steel Corporation, N. Kansas City

NEW JERSEY

Edgcomb Steel Corporation, Hillside

NEW YORK

Beals, McCarthy & Rogers, Inc., Buffalo 5

OHIO

Hamilton Steel Company, Cleveland 8
Summer & Company, Columbus 8

OREGON

American Steel Warehouse Co.,
Portland 14

PENNSYLVANIA

Levinson Steel Sales Company,
Pittsburgh 19

Potts-Farrington Company,
Philadelphia 7

TEXAS

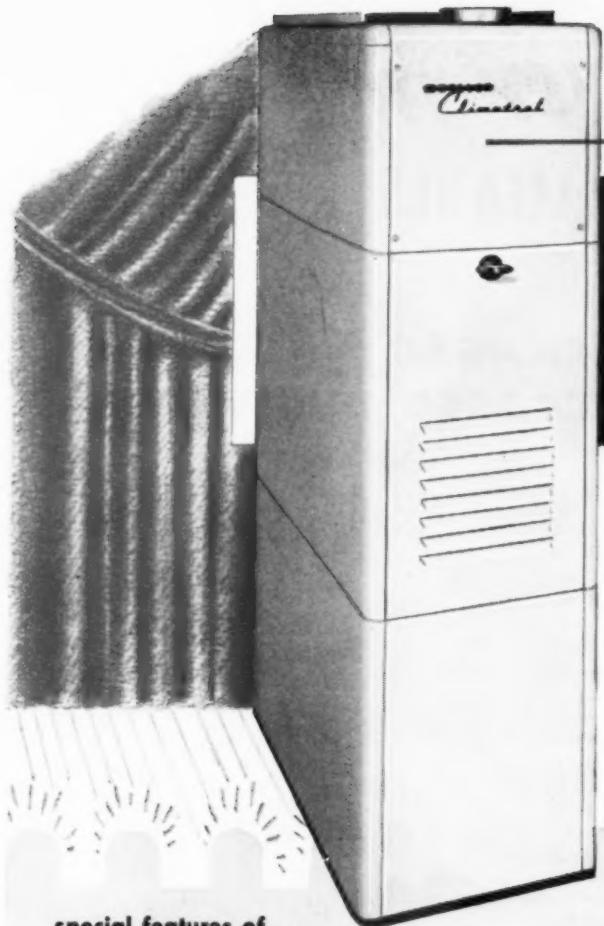
Marsh Steel Corporation, Dallas 10
Moncrief-Lenoir Manufacturing Co.,
Dallas 1 and Houston 1

UTAH

Salt Lake Hardware Company, Salt
Lake City 9

WASHINGTON

Seattle Steel Company, Seattle 4



special features of

New Type 110 Gas-Fired Winter Air-Conditioner

1. **Beautiful Cabinet** — available in handsome crinkle green, or gleaming white to match kitchen and laundry appliances. Controls are enclosed.

2. **Compact Size**—60,000, 80,000, and 100,000 Btu input capacities in compact, deluxe hi-boy cabinet.

3. **Efficient Heat Exchanger** — all-welded steel, with upward air-flow over abundant heat transfer surface assured by thermodynamic design.

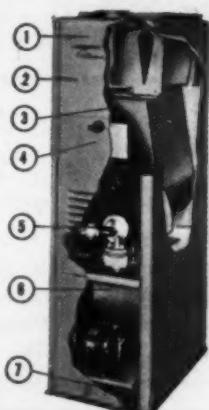
4. **Easy Cleaning**—all parts including blower, motor, controls, burner, and heat exchanger are accessible from front through easily-removed door and panel.

5. **Fuel-Thrifty Burner**—durable cast-iron type with individually drilled ports. Single-port air-shutter prevents clogging.

6. **Quiet Blower**—mounted on "live" rubber to eliminate vibration and noise. Multi-blade fan driven by continuous-duty, long-life motor.

7. **Filters**—mounted in base when return air is brought up from below. Side filter rack is available for return through side panels.

* Type 110-100 recently added to make this model available in a complete range of sizes for small homes.



B-22

another **NEW***

Mueller Climatrol fuel-thrifty Furnace

... the compact Type 110 Gas-Fired
Winter Air Conditioner

**Engineered and designed to get you more
sales from new low-cost housing and
individually-heated apartments**

The Mueller Climatrol dealer is always out in front in his market — *and in every part of his market*. This new Type 110 Gas-Fired Winter Air Conditioner is a prime example. It is small enough for closets, utility rooms, or basements . . . available in gleaming white enamel or Mueller Climatrol green . . . and competitively priced!

It gives you everything you need for the small-home, individually-heated apartment, and housing-project market. It gives you performance, design, and appearance — tailor-made to this specific market. And you know that's where a terrific volume of sales is coming from in the next year or two.

Look at the features of this new furnace. Think of the selling job you can do with this ammunition. Get behind it — and you're sure to come out with bigger profits.

Yes, the new Type 110 can be proudly added to the line of Mueller Climatrol profit-makers which have been developed through 92 years of building top heating equipment. Whether it's gas, oil, or coal — the Mueller Climatrol dealer is away out in front. Write for complete details on the new Type 110 or other equipment in the complete Mueller Climatrol line. *L. J. Mueller Furnace Company, 2010 W. Oklahoma Ave., Milwaukee 7, Wisconsin.*

MUELLER

Climatrol

REG. U.S. PAT. OFF.



FOR GAS

FOR OIL

FOR COAL



YOU'RE BUSY THIS FALL!

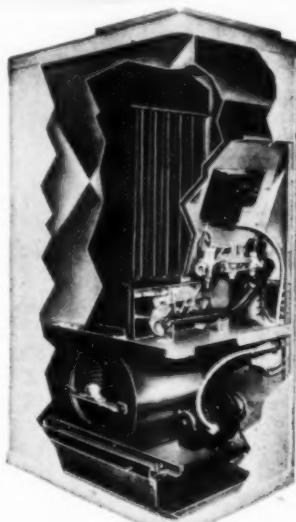
SAVE VALUABLE TIME!

USE...

VIKIMATIC **PACKAGED UNITS** and **PACKAGED DUCTWORK!**

SAVE TIME WITH—Units which are actually "fired" at the factory before shipment! You have positive assurance that every VIKIMATIC Gas-Fired Winter Air Conditioner (Models 2543 and 2545) you install will start at once, on the job. You save fuss and bother, and expensive recalls, with these packaged VIKIMATIC units—shipped assembled, pre-tested, pre-fired. When man-hours must count this Fall—do more jobs in less time, with VIKIMATIC Models 2543 and 2545 Gas-Fired Winter Air Conditioners!

SAVE TIME WITH—Prefabricated ductwork! Yes, modern ductwork, made of approved-gage aluminum, built to air conditioning standards—that's VIKIMATIC's very popular FLATPAK Preformed Aluminum DUCTWORK. There's more time saved this busy season when you use FLATPAK. Comes in all standard sizes and shapes of fittings—and you save on shipping, storing, and handling costs, too, because FLATPAK is shipped nested in handy cartons. Simply fit parts together on the job. It's time-saving, money-saving FLATPAK DUCTWORK!



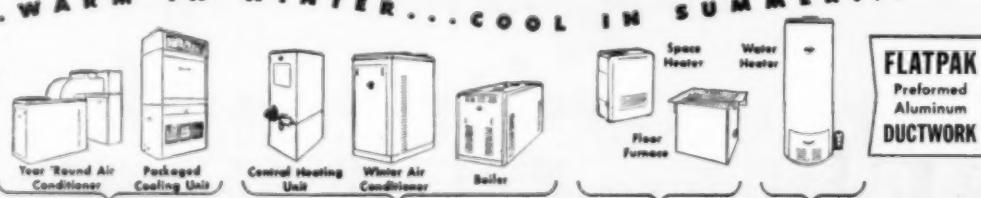
FLATPAK DUCTWORK—Ten vertical stack elbows shown as nested in space-saving shipping carton, and assembled ready to install.

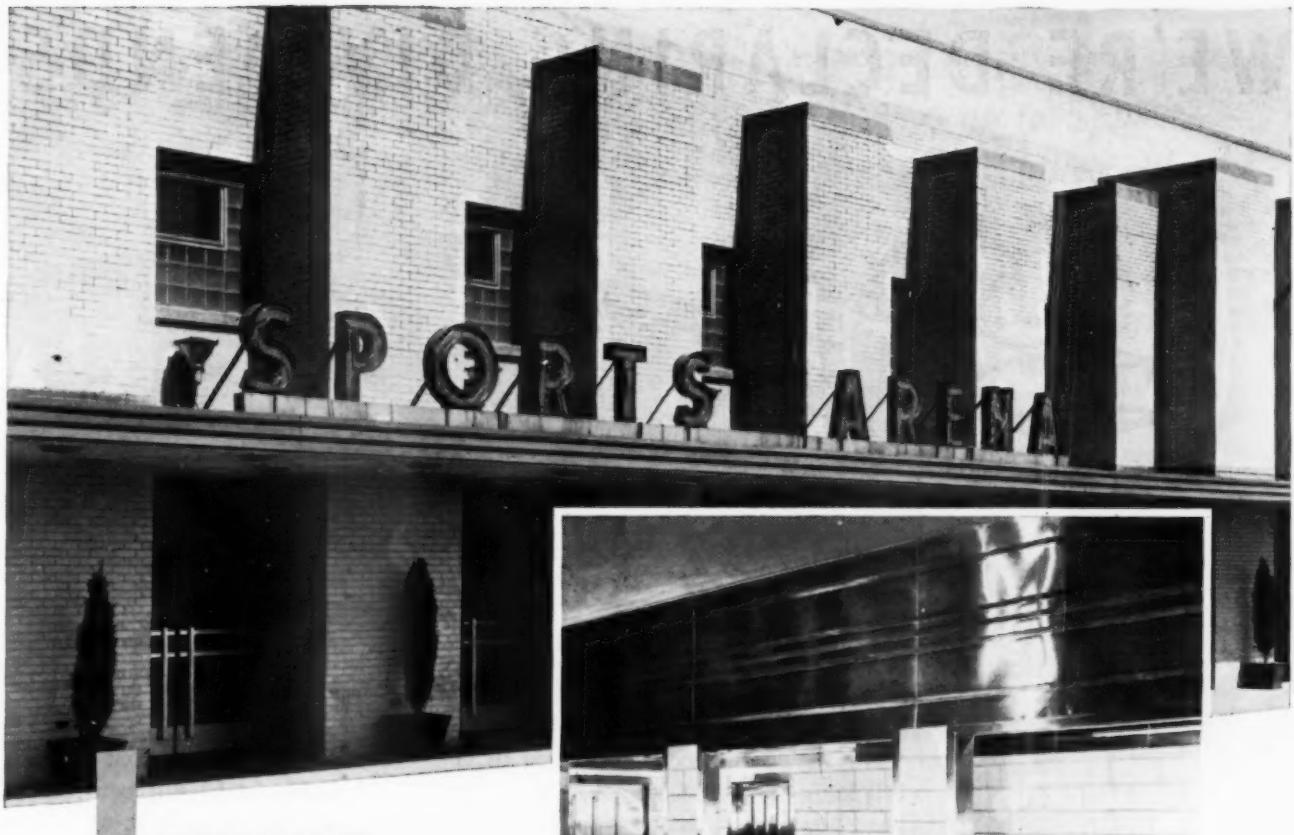
Cutaway view of Model 2543 (93,750 BTU input) and Model 2545 (109,375 BTU input).

DEALERS—This Fall when you're busy and man-hours must count, go see your nearest VIKIMATIC distributor. He has full inventory of time-saving VIKIMATIC *Packaged Units* and *Packaged Ductwork*.

DISTRIBUTORS—There are still a few valuable VIKIMATIC franchises available. Be prepared for this Fall's rush! Write, wire, or phone us TODAY for full details!

THE VIKING MANUFACTURING CORPORATION • CHerry 5500
1747 Chester Avenue, Cleveland 14, Ohio

...WARM IN WINTER...COOL IN SUMMER...						
						
COOLING AND YEAR-ROUND AIR CONDITIONING 		CENTRAL HEATING, basement and utility room, coal, oil, gas 		FLOOR FURNACES, gas & oil SPACE HEATERS, oil 		WATER HEATERS, oil, gas and electric 
						FLATPAK Preformed Aluminum DUCTWORK



TOLEDO CONTRACTOR SAYS:



"Our customers like stainless steel...so do we!"

Mr. Clarence Christen, president of The Fred Christen & Sons Co., one of Toledo's leading sheet metal contractors, has this to say about his experience with stainless steel fabrication:

"Our first experience with stainless steel was in 1929, when we made a group of large processing tanks which still are in service today. Since that time, we've fabricated equipment for restaurants, hospitals, industrial plants and just about every other application in which stainless steel is used.

"One of our most recent and more interesting jobs was at the new Toledo Sports Arena. The coping cover around the top of the building and extensive trim of the interior concession stands—

all of Republic ENDURO Stainless Steel—made an interesting and profitable project.

"Summing up our experience and thoughts about stainless steel, I would put it this way: Our customers like it...so do we!"

Would you like to learn more about this highly profitable end of the sheet metal business? You can NOW by writing for your FREE copy of Republic's booklet—*THE FABRICATION OF REPUBLIC ENDURO STAINLESS STEEL*.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Enduro STAINLESS STEEL

REG. U. S. PAT. OFF.

✓ Check ALL 12 advantages: • RUST AND CORROSION-RESISTANCE
• HEAT-RESISTANCE • HIGH MELTING POINT • LOW COEFFICIENT OF EXPANSION •
HIGH STRENGTH • GOOD DIMENSIONAL STABILITY • NO METALLIC CONTAMINATION
• EASY TO CLEAN • EASY TO FABRICATE • EYE APPEAL • LONG LIFE • LOW END COST



WE'RE DECLARING DIVIDENDS



on MAID-O'-MIST Convector Humidifiers

We're declaring dividends to you and your customers when you install Maid-O-Mist Convector Humidifiers. Available in 13 different sizes, these humidifiers have evaporation capacities of 1 to 10 gallons of water per day. Made entirely of non-ferrous metal and equipped with automatic (float operated) supply valve.

A **60%**

DIVIDEND ON AIR RESTRICTION IN THE PLENUM—

The individual, narrow troughs have a minimum of air flow restriction which permits their use in small plenums. Result—heating efficiency, a boost to your professional reputation.

A **30%**

DIVIDEND ON EVAPORATING AREA—

Fast continuous humidification even at low furnace temperatures or when the thermostatic control temporarily cuts off. Result—satisfied customers, more business for you.

A **50%**

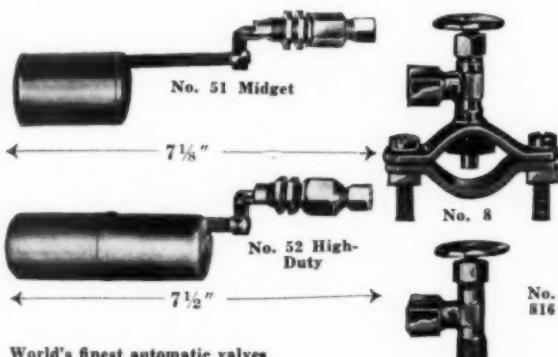
DIVIDEND ON INSTALLATION TIME—

You just cut out the opening in the plenum, attach the plenum flange frame, slip in the factory-assembled unit and make the water connections. A quick, easy profitable job for you.

START CASHING-IN ON THESE DIVIDENDS NOW!

See your jobber or write for attractive prices.

MAID-O'-MIST BRASS FLOAT VALVES AND SADDLE VALVES FOR THAT INSIDE JOB



World's finest automatic valves for controlling water level in humidifiers, air conditioners, evaporative coolers, air washers, etc. Easy thumb screw adjustment permits raising or lowering water line as required. Capacity sizes from 1 qt. to 1½ gals. per min. Pressures up to 125 lbs.

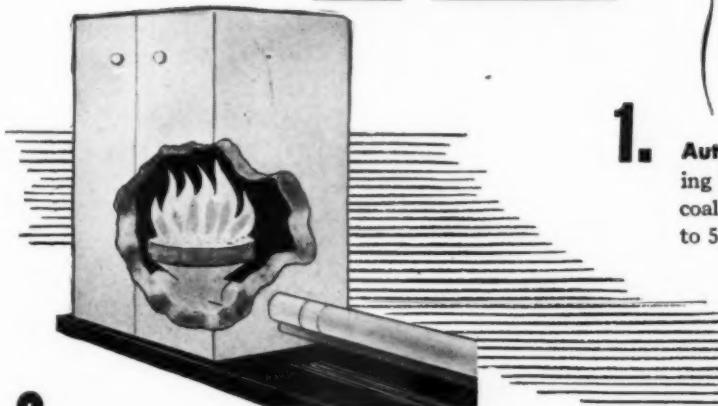
Saddle Valves (No. 8) for ½" and ¾" iron pipe. Each consists of machined brass forgings with insert tube to fit ¼" hole, and with brass wheel handle. Needle Valves (No. 816) control water supply to humidifier and feed valves.

MAID-O'-MIST INC.

3213 N. Pulaski Road
Chicago 41, Illinois



Offer Your Customers All Three



2.

The Revolutionary Anthratube—The Anthratube saves on fuel bills . . . its proved efficiency is over 80%. This scientifically engineered boiler-burner unit, with "Whirling Heat" and other revolutionary features, produces quicker response and superior performance than units using other types of fuel. Fully automatic.



3.

Anthra-Flo boiler-burner unit—An entirely new type boiler-burner which features a simple burner mechanism, attached by two bolts with all working parts outside boiler. Fully automatic, coal feeds direct from bin across single *stationary* perforated plate . . . ashes discharge by gravity into container within unit. Available for steam, hot-water and warm-air heating systems.

TODAY YOU CAN OFFER YOUR CUSTOMERS modern automatic heat with Anthracite equipment.

You can show your customers how to save money...as much as \$100 to \$200 every year and yet have *plenty of heat—clean heat—even heat*—and no worry about future supplies or deliveries.

For complete information about (1) New Anthracite Stokers (2) Revolutionary Anthratube or (3) Anthra-Flo boiler-burner unit, just fill in and return the coupon below.



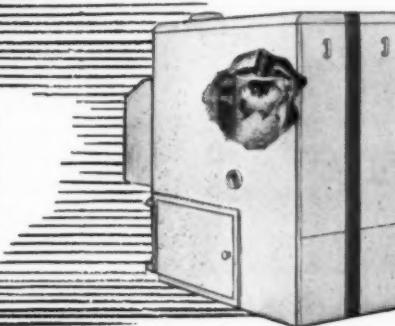
ANTHRAZITE INSTITUTE

101 Park Avenue • New York 17, New York

**for savings up to 52%
on annual fuel bills, with
modern automatic
Anthracite heat**

1.

Automatic Anthracite Stokers—Installed in an existing boiler or furnace, or in new houses, automatic hard coal stokers deliver *plenty* of heat quickly . . . save up to 52% on fuel bills . . . eliminate fuel worries.



ANTHRAZITE INSTITUTE
101 Park Ave., Dept. 9R, New York 17, N. Y.

Please send me more information on

1. New Anthracite Stokers
2. Revolutionary Anthratube
3. Anthra-Flo boiler-burner unit

Name _____

Address _____

City _____ Zone _____ State _____

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Recommend Stainless— and Call Ryerson for Quick Service

You can please your customers and increase your profits by recommending stainless. Use Allegheny Stainless when sheet metal jobs call for longer lasting, better looking materials. Quick, convenient Ryerson service provides the stainless you need when you need it—in any quantity, any type, gauge or finish.

When you call Ryerson, you get Allegheny Stainless—the time-tested product of America's oldest producer of stainless from America's pioneer stainless distributor. A quarter-century of stainless experience enables Ryerson to help you in specifying and fabricating this profit-building material.

Your regular shop equipment is sufficient for fabrication of Allegheny Stainless in most sheet metal applications. Your stainless customers will profit because this beautiful heat and corrosion re-

sistant metal requires virtually no maintenance. Often it costs no more in the long run than other materials regularly used for quality jobs. So go after stainless business and get quick shipment from your nearby Ryerson plant. We'll be glad to work closely with you.

PRINCIPAL PRODUCTS

BARS—Carbon & alloy, hot rolled & cold finished	STAINLESS—Allegheny metal plates, sheets, bars, etc.
STRUCTURALS—Channels, angles, beams, etc.	PLATES—Sheared & U. M., Inland 4-Way Floor Plate
TUBING—Seamless & welded mechanical & boilertubes	SHEETS—Hot & cold rolled, many types & coatings
MACHINERY & TOOLS—For metal working	

STAINLESS FABRICATING TIPS—Write today for your copy of our helpful booklet on Allegheny stainless fabrication.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI
CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

AMERICAN ARTISAN

Business Strengthens

RECENT IMPROVEMENTS IN THE TONE of business reports are being substantiated by facts and figures that reflect improvement across the entire business front. Much of the gloom and pessimism of several months ago has given way to optimism—or at least a cautious optimism.

Industrial production had fallen from its peak of 195 last October to 169 by June. Second quarter dividends this year took a 28 per cent dive from their high point last year. Unemployment rose slowly but steadily to more than 4,000,000 in July. In spite of these declining indexes of business activity, there are now indications that the so-called recession has not been behaving in the usual way. Consumers' prices, for example, have remained slightly above 169 for five months, not far below the postwar peak of the index. The wholesale price index, showing a much sharper drop, nevertheless has declined moderately when compared with past depressions and in July, this index reversed its downward trend and began to rise again.

Also of importance in the short-run business picture is the fact that the government is returning to deficit spending which will tend to be inflationary. The second quarter cash deficit of \$2.2 billion was the first substantial deficit in three years.

Finally, in the present situation there is none of the evidence of financial strain apparent in past depressions. Interest rates are low, the mortgage structure is far better, and the stock market has been rising steadily since the beginning of June.

There is now some evidence that the downward pressure brought on by buyers who have been

holding off buying in anticipation of sharply lowered prices is being relieved. Many have been returning to the market in the belief that the bulk of price adjustments is over, at least for the time being. The rising wholesale price index bolsters this belief.

The overall picture looks like a leveling out with a real seasonal push of buying this fall.

This raises the question of whether adjustments made to date—primarily in prices and inventories—have been enough to prevent further declines, or whether recent signs of firming are but a brief lull in a sustained recession which has not yet run its course.

On the whole, it appears that the process of readjustment is not yet complete and that employment, output, income, and prices may continue to drift downwards.

It has become apparent that the country is entering a period of intense competition. A flexible and determined attitude on the part of business toward merchandising will go far in shortening the period of correction and hastening the day when a sound economic advance is resumed.

During this transition, the warm air heating industry is especially fortunate in having the sale of its products bolstered by the timely national consumer publicity program of the National Warm Air Heating and Air Conditioning Association. Over 31 million readers across the country have been exposed to warm air heating publicity emanating from the association's headquarters. This national support is building prestige and sales for warm air heating equipment at a time when it is most needed.



Arnold Kruckman's

IT WOULD be startling and revealing to make a summary of all the actions and incidents of the last 20 years that have gradually changed the actual character of this republic from its original essence of democracy to the present autocratic socialistic welfare state. There is no doubt in the mind of this correspondent that an enumeration of all evidence would convincingly demonstrate we are no longer what we were intended to be by those who founded this nation. The actual change is insidious and has happened almost imperceptibly. This does not mean that we have not experienced and have not been aware of the changes, but that we have not believed the evidences of our senses.

Fact Finding

The latest incident is the President's steel fact finding board. As we see it now, it circumvents compliance with the Constitution and the law. The board was appointed by the President to create a public sentiment that will force the managements of the steel corporations to comply with the desires of the CIO unions. There isn't a remote doubt of this purpose. The board has no power to enforce its findings, but it has the power to publish its findings together with recommendations. Its findings and recommendations will be reported to the President and simultaneously published to the country. There is no doubt that the report will be favorable to the CIO unions and will recommend that the unions get approximately what they seek. How the President will implement the recommendation is

still a puzzle. He and those who are behind him in this adventure unquestionably depend largely upon public opinion. It is possible that they may have a plan to transfer the recommendation and the pressure of public opinion to one of the enforcing agencies in order to transform the whole business into reality. Obviously, it is true that as steel goes so goes the rest of the working machinery of the national economy. This means that if, by any chance, the assumed recommendations of the President's fact finding board can be enforced, raises in wages and expansion of the welfare plan for workers will become part of the entire national economy. It has been estimated that the plans as proposed in the hearings held in New York before the board involved an added expenditure of \$25 billion. It is easy to understand, therefore, why the 60 or more steel companies which appeared at the hearings have served notice that they cannot conceive of any circumstances under which they will comply with such recommendations. This seems to mean that there may be a direct head-on clash ahead between welfare statism and those who still believe in the old forms of competitive, individualistic business under democracy.

CIO Inspired

To understand why the situation appears as critical as has been outlined, it is necessary to realize that the inspiration for this board has come wholly from the CIO and those behind the CIO. Phil Murray, CIO president, has frankly been sponsor of the idea. Mr. Murray, a

Scotchman, is not without caution. He is not an ultra-radical. It is puzzling, therefore, to determine the influence from which stems this whole trend reflected in the fact finding board. It has long been current thought in Washington that there is a radical influence which is exerted upon the White House, and upon those who have close relations with the White House, and which is not personalized in such a way that it can be identified. Apparently this radical influence has no direct individual personal relation with the President or with those in the highest part of the White House hierarchy, but it is nevertheless pervasive and effective. It will be interesting when the identity of this influence is finally revealed.

A Stacked Deck?

The one-sided character of the fact finding board is so patent that no effort apparently was made to hide it. The three men who have been sitting as umpires in the walnut paneled air conditioned court room in the Federal Building in New York, with all the austere dignity of court atmosphere, taking thousands upon thousands of words of testimony, accepting thousands of pages of documentary evidence, and trying to sift innumerable papers and tables presented by experts, are two lawyers and a university professor. They are Dr. Carroll R. Daugherty, Northwestern University professor, chairman of the panel; David L. Cole, a labor relations attorney who has frequently served as an arbitrator; and Samuel I. Roseman, once a judge, well-known as a lawyer, and

Washington Letter



internationally conspicuous as an advisor to the late President Roosevelt, about whom he has written articles and books. The extremely liberal coloration of these gentlemen is indisputable. In their conduct of the hearing they did not prevent a situation which virtually permitted the witnesses for the CIO to become the prosecutors and the witnesses for the steel companies to be the defendants.

One vs. Sixty

The CIO pleaders were able to take more time in the presentation of their case and their charges than the steel people. There were fewer CIO witnesses, and they could take practically all the time they wanted. On the other hand, the 60 or more steel companies were obliged to compress their testimony to an average of 15 minutes, 30 minutes at the utmost, which led Clarence B. Randall, president of Inland Steel Company, to say, "The labor monopoly took half the time of this board. The 60 or more steel companies are now before this board. Many of them have asked to be heard on the management side. Yet there has been allotted to them eight days—eight days to be divided between them, exactly the same time given the labor monopoly. Many fine institutions must content themselves to the brief 15 minutes, or at the utmost a half hour, in which to discuss a question on which the whole future of their enterprises may hinge. That is complete madness. No orderly discussion nor fair results can flow from such a process. I repeat—this is the repeal of collective bargaining—this is government wage fixing, the inevitable consequence of

labor monopoly.

"In my judgment, the steel industry cannot by its presence here be deemed to consent that this process go on. I must protest to you and to the President, and to the American people, that this is a distortion of our economy. I submit to you gentlemen (the board) that it lies fully within your province to protest likewise. You will hear our doubts as to the propriety of this political procedure, and you are not the men I think you are if you have not already yourselves entertained similar doubts.

"I ask you to be courageous. I ask you to be statesmen, I ask that in your recommendations you not only record our doubt, but that you express your own honest conviction to the effect that the very establishment of this fact finding board is in itself a bad thing for the United States.

A Dangerous Precedent

"It is bad in principle—therefore it would be bad at anytime, but today it is dangerous. Our country is now in a recession. Production is falling in industry after industry. Unemployment has reached its highest point in seven years. You cannot safely pile new uncertainties on an already uncertain situation. You cannot safely discourage investment in private enterprise, which after all, is the source of all employment, all wages, all profits, all production—the livelihood of the American people. This is surely the tire for management, for labor, and for government to exercise genuine statesmanship for the common good. It is obviously no time, in the face of the present situation throughout the world, for

any interest to pursue a course which could precipitate a grave economic crisis in the United States."

Future at Stake

In an earlier part of his statement, one of the most remarkable statements made by an industrialist in recent years, Mr. Randall said: "It is no exaggeration to say that the welfare of every citizen of the United States is at stake in the hearings before this board, and by this I mean not only the fact that you gentlemen are authorized to make recommendations that might affect the prosperity of the whole nation, but the fact that you are here at all.

"When the President announced the formation of this board, he was in fact announcing an industrial revolution in America. By doing so, he has declared himself as favoring a new social order and one so different from that under which our magnificent production record has been achieved that unless the process is stopped, and stopped at once, there will be no possibility of turning back.

"Through this means, whether he knew it or not, he has proclaimed that wages shall be fixed by the government. This step, the first one taken by those who set out to establish a socialist or corporative state, is followed by the fixing of profits, and then when incentive is killed and production falls, the final step of nationalization follows. Europe came close to starvation because of this tragic sequence and was saved only by the dynamic policy of a free America. Yet here is the same pattern." (Continued on page 172)

Simplified Bookkeeping System

For Heating & Sheet Metal Contractors

PART FOUR

ARTHUR ROBERTS
Pompton Lakes, New Jersey

Cash sales have been discussed in previous installments of this series and this month the handling of credit transactions is described. Many major sales in the heating and sheet metal industry require extension of credit and dealers should be prepared to record these sales correctly.

CASH receipts, cash disbursements by check and the costing of repairs and installations have been handled in preceding installments of this series.

Two more elements in accounting will now be covered, credit transactions and internal transfers.

Under the double-entry system, credit sales and credit purchases are recorded in separate books, a journal and ledger for sales to credit customers, a journal and ledger for purchases on credit from suppliers. Cash transactions go through a separate cash book. When the composite journal was introduced, provision was made to carry credit sales and purchases in the same book with cash transactions. Individual accounts with credit customers and suppliers were kept in separate sections in the ledger. The routine is simple. Just put Debit and Credit under the accounts receivable column and under the accounts payable column, to wit:

Accounts Receivable		Accounts Payable	
Debit	Credit	Debit	Credit

All bills owed by customers are debited in the accounts receivable column, the offsetting entry is a credit to sales. Payments by customers are credited in this column, the offsetting debit entry listed under cash received. See the accompanying form for the accounting procedure. This layout combines the 5 main classifications of accounts into one composite journal form.

If you are departmentizing, classifying sales according to type, such as over-counter, service and repairs, installations of oil burner jobs, air conditioning, etc.,

insert the columns suitable to your requirements. In the form given we departmentize for sales of merchandise, repairs and service, installations. It is wise to carry at least these three classifications of sales. Many *Indoor Comfort* dealers lump their sales under one head, consequently, they do not know how much they actually gain or lose in these three main divisions of their business. Departmentization will be discussed in detail later.

If your business is of such a type that you find it is desirable to keep your sales or purchases in separate journals or registers, do so. Follow the same routine explained here, receivables and payables are entered in their respective books instead of under the columns mentioned, the figures are summarized at the end of the month, sales are debited to the customers and credited to sales, purchases from suppliers are credited to them and debited to materials, office expense, truck expense or whatever account is involved.

Using either method, you may keep individual accounts with customers or suppliers in the ledger. These individual accounts will show what you owe each supplier and what each customer owes you with the proper payments, which are posted from the cash receipts and disbursements columns in the journal. To keep a record of accounts with individual customers or suppliers, use ordinary ledger sheets purchased in stationery stores.

Where individual accounts are carried in the ledger for credit customers and suppliers, the accuracy of the postings is verified monthly by checking the total of the open balances with control accounts carried in the ledger. They should balance. For example, say that

the accounts receivable column in the journal shows the following entries for credit customers.

Item to be entered	Accounts Receivable	
	Debit	Credit
S. Smith	\$200	
J. Jones	75	
P. Edwards	50	
K. Sims		\$65
P. Harris	80	
S. Martin		90
T. Reynolds	100	
A. Evans		85
Totals	\$505	\$240

At the end of the month when you summarize, you would post \$505 to the debit of the accounts receivable control account in the ledger and \$240 to the credit side. At the same time, you would post the amounts shown in the two columns to the individual accounts in the customer's ledger. Obviously, the control account and the total on the individual accounts should balance to the penny, if the work has been done accurately. If they do not balance, check back to find out why. Follow the same routine for accounts payable.

When you buy on credit from a supplier, enter the amount under Credit in the accounts payable column, the offsetting debit to the account involved, when you pay the supplier, enter the amount under Debit, the offsetting credit is listed with the checks drawn from bank. Summarize the accounts payable column at the end of each month, post to the individual accounts, balance with the control account in the ledger after debiting and crediting the control with the total debits and credits for the month.

In some instances, contractors dispense with keeping individual accounts with suppliers. They pay their bills promptly, take their discounts, and so, in most cases, the bills are paid the month they are presented, hence, the control account for accounts payable carries the needed information. What open accounts carry over from one accounting period to the other are easy to control by keeping them in a special folder for unpaid bills. This eliminates the work of opening an accounts payable section in the ledger. If this method is practicable for your business, use it. In all cases, keep a special folder for unpaid bills, transferring them to a paid file when paid. Customer accounts are not so easy to control. If you give credit, you can expect some delinquencies, and so, it is wise to post these accounts individually in a section of the ledger, or, if you have many of them, in a separate customer's ledger.

Accounts are not usually opened for telephone, property taxes, light, water, etc. These bills must be paid promptly, so they are held in an unpaid file until paid, then entered and charged direct to the proper account.

If the contractor enters all cash and credit transactions in the ledger as described in these articles so far, he has all the information he needs to determine his profit or loss with the exception of internal entries, debits or credits to various accounts that have no direct contact with outside transactions, but which must be made in order to reflect true profit or loss.

These entries may be classified under these general heads:

- Depreciation
- Accrued items
- Inventory
- Adjusting entries.

Depreciation is not billed by a supplier or charged to a customer as such, although it should be included in the cost of operation so that the charge is passed on to the customer in the price he pays for service or goods. For this reason, depreciation is not chargeable under any of the previous forms shown, which cover the cash and credit transactions in barter. In large organizations, depreciation is entered in a general journal in which entries of this kind are recorded. In the composite journal, a column can be added to cover such items, using the explanation column to detail the facts. This column should be headed:

Internal Transfers

Debit	Credit
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In the case of depreciation, suppose you bought furniture and fixtures two years ago worth \$1,000. At that time you entered the purchase in the books as an asset worth \$1,000 and offset this debit by a credit to the cash account, because you paid cash for the goods. Every year you deduct 10 per cent depreciation, which is charged against profit and credited to a reserve for depreciation on furniture and fixtures. In this case, the charge to profit and loss would be \$100, the credit to the reserve, \$100. For simplification all the reserve accounts may be kept on one page in the ledger headed, Reserves for Depreciation. The same routine is followed for all depreciation. When the total on the reserve accounts is deducted from the original cost of the assets, the balance is known as the unrecovered cost: the current book value of the depreciable assets.

Always depreciate on original cost. Always deduct sufficient depreciation, otherwise, you short-cost your sales and you pay more income tax than you should.

Accrued Items Defined

Accrued items cover bills due but not paid at the end of an accounting period when statements are prepared, and cover such outlays as mortgage interest, taxes, wages. If the end of the month is on Wednesday with your payday on Saturday, and you prepare a profit and loss statement showing business done to Wednesday, your workers have Monday, Tuesday, and Wednesday wages due them, an expense that hasn't been entered in the books because you do not enter the payroll until the checks are drawn on Saturday. So, there is an accrued liability for three days' payroll at the time the statement is prepared. On monthly statements, these entries are made in pencil. At the end of the year, an account entitled Accrued Liabilities should be credited with the accruals due, the payroll, mortgage interest and other accounts charged. When the accrued liabilities are paid, the accrued liabilities account is charged and cash is credited. Every transaction, external or internal, has a debit and credit side. Usually depreciation is penciled in monthly and no entries made until the end of the year. Some dealers never show depreciation as a monthly charge on the

Date May 1949	Received from	Job No.	Debit Cash received	Debit Discount allowed	Bank deposits	Credit Merchandise sales	Credit Repairs, Service sales
10	Store sales—mdse—service		125.00			98.00	24.50
	1st National Bank		1000.00				
	Central State Bank		40.00				
	J. Salvage Company		20.00				
	Alfred Johnson	71	200.00				
	J. Daly		25.00		14.10		
11	Store sales		196.00	4.00	196.00	196.08	
	James Murray	82					
12	Store sales—service		15.00				15.00
14	Store sales—merchandise		294.00	6.00	309.00	300.00	
	Edward Farrell					45.00	15.00
31	Store sales		55.00				53.90
	Peter Sims	66	485.00		540.00		
	Totals		\$2455.00	10.00	2455.00	692.98	54.50

Monthly summary of journal entries

Cash income and bank deposits should agree to the penny.

Debits

Cash received	2455.00
Discount allowed	10.00
Accounts receivable (control)	535.00—(Also post charges above to individual customer accounts)
	\$3000.00

Date 1949	Item to be recorded	#	Credit Cash Drawn from bank	Credit Discount received	Debit Labor	Debit Materials	Debit Truck expenses	Debit Office expense	Debit Other disburse- ments
2	S. Smith and Sons	78	245.00	5.00					
3	J. Jones Company	79	20.00				20.00		
4	T. Johnson	80	10.00					10.00	
5	Petty cash fund	81	25.00						
6	Harry Sherwood	82	64.10		64.10				
	R. Miller	83	100.00						100.00
	Essex Light Company	84	30.00						30.00
	Eastern Telephone	85	12.00						12.00
7	S. Levy—stationer	86	100.00						100.00
9	M and H Company	87	60.00			60.00			
12	Silvers and Kane					180.00			
	Fredericks and Simmons						32.00		
	Samuel Richards							18.00	
14	P. Martin—bad debt								
15	Mdse. credit—registers						20.00		
17	Allowance on truck								
	Loss on inventory								
30	Cost of goods sold								
	Petty cash disbursements								
	Accrued wages				70.00				
	Totals		\$666.10	5.00	134.10	220.00	52.00	28.00	242.00

Monthly summary of journal entries

Debit

Labor	\$ 134.10
Materials	220.00
Truck expense	52.00
Office expense	28.00
Other disbursements	242.00
Accounts payable (control)	270.00—(Also post to individual accounts)
Petty cash fund	25.00
Internal transfers	2222.72—(Post to accounts designated under Explanation, Item to be recorded, or on Petty Cash slips)
Total debits	\$3193.82

Credit Installation sales	Credit Sales tax	Credit Other receipts	Debit	Credit	Explanation
	2.50				
		1000.00			
		40.00			
		20.00			
				200.00	
		25.00			
		3.92			
475.00			475.00		
				60.00	
		1.10			
				485.00	
475.00	7.52	1085.00	535.00	685.00	
<i>Credits</i>					
Repairs and service sales		\$ 54.50			
Merchandise sales		692.98			* (Also post credits above to individual customer accounts)
Installation sales		475.00			
Sales tax		7.52			
Accounts receivable—(control)		685.00*			** (Posted individually to respective accounts in ledger.
Other receipts		1085.00**			Identify account under Explanation)
Total		\$3000.00			

Accounts Payable Debit	Credit	Petty Cash Debit	Credit	Other Internal transfers Debit	Credit	Explanation
250.00						Due supplier for sheet metal
						Re-line brakes
						Printed stationery
25.00						To replenish Petty Cash Fund
						Work done on Job 10
						Rent for business property
						Light bill for April
						Phone bill for April
						Typewriter—add to asset account
						Sheet metal bought for cash
180.00						Accessories bought on account
32.00						Truck repair bill on account
18.00						Stationery bought on account
		50.00		50.00		Bad debt written off against profit
20.00						Registers returned—credit memo
		500.00		500.00		Allowed \$500 for new truck in trade
		150.00		150.00		Inventory revaluation shows \$150 loss
		1500.00		1500.00		Charge cost of goods sold—credit inventory
		22.72		22.72		Charged as per slips on file
				70.00		Wages due to date of statement not paid
270.00	230.00	25.00	22.72	2222.72	2270.00	
<i>Credit</i>						
Cash drawn from bank		\$ 666.10				Balance in petty cash drawer should be \$2.28
Discount received		5.00				
Accounts payable (control account)		230.00				
Petty Cash Fund		22.72				
Internal transfers		2270.00				—(Post internal transfers to accounts designated under Explanation)
Total credits			\$3193.82			

profit and loss statement, but it should be included to reflect accurate profit.

An ending inventory figure is needed to prepare an accurate profit and loss statement. This figure is not in the books and you can't obtain an accurate figure from the books. Even if you cost merchandise and materials sold and enter these costs in the books, or keep stock control cards, you can't get an accurate figure. The only way to make sure that your ending inventory is figured accurately is to take a physical count, then charge cost of goods sold by the difference between the book value of the stock and the physical count.

Book value of stock	\$5,000
Value of ending inventory as shown by a physical count.....	3,500
Cost of goods sold, merchandise and materials chargeable to the accounting period just ended.....	\$1,500

The assumption is that the difference between the \$5,000 recorded as the value of the goods, comprising the value of inventory when last taken and the cost of goods bought since then, \$5,000 in all, and the \$3,500 count taken at the end of the period, has been used on jobs or sold over-counter by the management, therefore, it is chargeable as the cost of goods sold to the current period. The recording can be made under Internal Transfers debiting cost of goods sold and crediting inventory with \$1,500. In a subsequent article on auxiliary forms we will go further into the matter of inventory control. Of course, the dealer can cost each sale for inventory purposes as he goes along, in which case, he will need a column in the journal headed:

Cost of Goods Sold

Debit	Credit

As you make a sale or finish a job, enter the cost of the item sold or materials as a debit to the cost of goods sold account, the offsetting credit to the inventory account at the end of the period when you summarize. Get the cost figures from job record sheets or suppliers' invoices. This means extra work, and so, some contractors do not do it, depending upon a physical count to get the inventory figure. The physical count assures accuracy but it takes so long that few businesses can spare the time every month. Only where inventory is very limited can this be done. Lacking a cost of goods sold record in the journal and an inventory count, there is only one choice left, to estimate. If the dealer estimates wildly, he will more than likely go wrong on profit. He can approximate accuracy by averaging the cost of goods or materials sold in ratio to sales for a prior period, perhaps three months, and use this ratio to estimate the cost of sales on a current statement. When he takes the actual count he can adjust his books. The estimated figure is not entered, only the results of an actual count. For example, suppose that the cost of sales or cost of goods sold was 60 per cent for a prior period, that sales total \$20,000 for a current period, then 60 per cent of \$20,000 or \$12,000 is considered the cost of goods sold, over-

counter merchandise and materials used on jobs for the current period. By this means, it is possible to bypass a monthly inventory and get a fairly accurate figure without keeping a record of the cost of each item sold in a period.

Adjustment for Errors

Every business requires adjusting entries for errors caused by charging the wrong accounts. Bookkeepers do not erase such entries once an accounting period has passed. It is necessary to make adjusting entries by debiting one account and crediting the other, which can be done by means of the column, Internal Transfers, the proper explanation in the designated column. A trade-in allowance, for example, would require crediting the unrecovered cost of the equipment on the books, charging it to the new equipment, then handling the balance of the transaction through the journal in the regular way, either as a cash or credit transaction. If you find that in a foregoing period you charged one account in error, the only way to adjust the record is to enter a credit to this account and charge the correct amount. Sometimes these transfers can be made right in the ledger between the accounts involved. Many times, however, they require an explanation or a journal record and should be journalized with full particulars.

Petty Cash Records

Petty cash disbursements are monthly internal transfers. If the slips in the petty cash drawer total \$22.72 as shown in a previous explanation, the expenses involved are charged and the petty cash account credited:

Petty Cash Disbursements (posted individually)	Dr. Cr. \$22.72
Petty Cash Account.....	\$22.72

If the petty cash account shows that \$25 was drawn to make these payments, the balance on this account will be \$2.28 and this amount should be in the cash box. The summary for petty cash disbursement is a calculation apart from the regular journal summary. In some cases, if disbursements are frequent, you may have to make this summary every week, in which case, it can be handled through the internal transfers column. Some dealers keep a small bound book for recording petty cash transactions, making the transfers to the ledger from there, others keep the paid slips in a petty cash envelope, make entries and file the slips away. Bookkeeping is flexible. We show the fundamentals in these articles. Follow them and you should have no difficulty keeping adequate and accurate accounts.

We cannot go into every unusual transaction that enters into business. They are in the minority anyhow. A high percentage of the recordings will follow the standardized routine explained under cash and credit layouts. Most of the adjusting entries, including those needed to charge and credit the accounts to profit and loss, will be made at the end of the year, and inasmuch as it is wise to have your accounts audited, the auditor can handle this phase of the work. Some businesses have part-time bookkeepers come in every month to check over the accounts. It's a wise precaution against error.

Build a Sales Personality Through Advertising

BETTY LEE GOUGH
New Orleans, Louisiana

GEORGE BROWN HAS A FURNACE that has just gasped its last breath and given up the ghost. He looks in the paper to study furnace advertising in order to get some impression as to the character of the firm from the ad. When he looks at your ad will he see the same copy and the same format that he can observe in your competitor's ad? Or will there be something in your ad to catch his eye and give him the feeling that he will get the most for his money, as well as the best service from you?

What can be done to build individuality for your company? Is it possible to make one heating firm such a stand-out over its competition that the customers gravitate to the progressive company? Moreover, is it possible to do this with the modest promotional funds available to most heating companies?

The fact is that individuality has been successfully created for small companies. It can be done. Alert, astute business men all over the country are doing it every day.

They have done it in a variety of ways. All of the ideas that worked had one basic thing in common: They not only sought to create a character for the company (or for its owner or both), but sought a *favorable* character impression. That is important. Anybody can become well-known. All you have to do is to rob a bank. Becoming well-known and favorably-regarded at the same time is not so easy. But it's well worth the trouble. The *Indoor Comfort* dealer who can build so much individuality for his business that people think of him first, reaps a harvest of plus profits for his trouble.

Out of the experiences of successful *Indoor Comfort* dealers, eight rules for building business individuality stand out. All of them are tested and true.

1. *Find a character to symbolize the company.* This is an old sales promotion trick, but it never fails to work.

Dutch Cleanser has its Old Dutch Girl who chases dirt. Electric utility companies all over the country employ the crazy little character, Reddy Kilowatt, to symbolize the usefulness of electricity. Aunt Jemima pancakes have made the Aunt Jemima character a national figure. Philip Morris cigarettes dramatized Johnny, the bell boy, into a living symbol of the product.

In a similar way, it is possible to dramatize a fictitious character to lend individuality to the heating firm he symbolizes—and sells. If you do this, be sure that the character you create is a likeable one, and that he has sufficient punch and reality to hit the customers between the eyes. Above all, be sure that every action he takes sells your company.

It is not even necessary to create a fictitious character. Your own personality can be dramatized into a selling symbol of your company.

This was done by one small firm in Texas. The owner faced the problem of giving his company an individual character that would make it stand out, because his was a small operation and he faced stiff competition from almost a dozen established companies, each of which was bigger and had at its disposal greater funds for sales promotion and advertising.

He found a way out of the dilemma,

and in the process built a booming volume, by dramatizing himself. Instead of running conventional advertisements such as his big competitors were doing, he coupled straight merchandise offerings with advertised spot editorials. Every ad he ran carried a small box headed, "Comments." In this space, he gave meaty, homey comments on the state of the world and of his city, and chatted in country-town style about topics of the day. Each of the spot editorials was signed with the owner's name.

"If you're doing something like this," he warns, "you'll have to watch out for one pitfall. Don't discuss controversial topics. Don't take sides in a political contest or in any contest. Don't say anything to which any group, or even any persons, can object, because if you do, you will find yourself kissing that group of customers goodbye. You can steer a middle course, avoid heated subjects, and still write a couple of paragraphs of punchy, interesting copy that will increase the readership of your advertisements and build an awareness of you and your company."

2. *Make yourself a well-known citizen.* Everybody who knows Bill Smith, the civic leader, usually knows that he is connected with the Smith Heating Company, and if the public likes what Bill Smith the civic leader does, it usually feels kindly toward his company.

How can you become a civic leader? *Indoor Comfort* dealers usually belong to local civic groups such as the chamber of commerce, Kiwanis and Rotary clubs, and the like. All you have to do is to take an active interest in what these clubs are doing, instead of regarding your dues check in the light of a charity contribution.

Before long, they will be turning to you with requests to work on this committee or that. Then you'll be in the limelight as the man who helped to raise funds for the new hospital, or who was instrumental



in having money appropriated to build a new dam.

A California business man is famous in his town as the dollar bill man. Each day, he scans the births column of his local paper, and sends a congratulatory note to each new-born child, inclosing with each a crisp, new dollar bill fresh from the mint as his contribution to the child's success in life.

His letter reads thus: "We're not the Mayor's official welcoming committee, but we wish we were. The announcement in the press of your recent arrival naturally attracted our attention. Tell Mom and Dad that they are real millionaires to have a grand little fellow like you in the house. In the hopes we may have the honor of starting your college education program, we are tucking in this bill to begin a bank account or insurance policy."

Civic Activities

There are scores of ways in which you can make yourself locally famous. You can be a leader in Community Chest drives. You can sponsor semi-pro baseball and football teams. By making yourself the man everybody knows and likes (that's important), you can increase the public's awareness of your heating firm to the point where they think first of coming to you.

3. *Find some problem the customer faces, give it a name and offer a solution.* What problems do the customers face? Millions of problems, ranging from getting up in the morning to the mortgage notes that come due on the fifteenth, face all of us.

You solve a customer's problem, or he wouldn't bring his good dollars to you. *Indoor Comfort* dealers seldom think of themselves as problem solvers, but they are. Examples of how smart business men have discovered problems and staged the solutions to them can be found everywhere. Years ago, Bon Ami cleansing powder decided that its customers worried about whether cleansers would scratch a delicate surface, and so the slogan, "Hasn't Scratched Yet," was born.

Tooth paste advertisers ask whether you have pink tooth brush, or are bothered with bad breath, and suggest a way to solve the problem by purchasing their products.

These are common, everyday things that were seldom thought of as problems. Alert capitalization created individuality for the firms that offered to solve them. A few minutes' thought can uncover many problems that your customer faces. These can be named, and dramatized to give your firm individuality.

4. *Take something common to the industry and give it a brand name of your own.* Lucky Strike cigarettes did this with the slogan, "It's Toasted," although all cigarettes go through the same toasting process. To the customer, Luckies are different because they are the only cigarettes boasting of the toasting process.

5. *Identify everything you sell.* Instead of pushing the brand name, push the slogan, "Buy Your Jones Furnace from the Smith Co." Identify everything you sell as yours.

Each piece of printed or duplicated material that goes out, including such routine things as sales slips and inserts, should bear a message identifying your company. The message costs you nothing extra; it can pay you dividends by helping to give your firm individuality.

When you advertise, don't merely offer certain services. Make them your offerings by identifying them as "Harry Jones' Specials" or whatever they are.

6. *Add a physical touch to make your heating firm different from the rest of the firms in your town.* An example is Texaco's dramatization of its dealers' "Clean Rest Rooms." This is a bonus, an extra offered the public over and above the opportunity to buy gasoline, or the quality of the gasoline.

The physical difference can be anything. It might be a ladies' room with free sample size lipsticks, if you want to follow up the success achieved by the oil companies. It might be free coffee for customers at any hour of the day. It might be anything extra or free that the customer gets only when he buys from you, and it need not be an expensive offer.

7. *Invent a "process" name.* What do your customers get when they buy from you? Is it a certain job? Or is it a "satisfaction guarantee?" That's what one Western

Indoor Comfort dealer offers his customers. He advertises his specials as the satisfaction guarantees of the day, or week. In so doing, he gives them individuality, and gently suggests to the customer that true satisfaction can only be had from him.

8. *Be distinctive in your advertising and sales promotion.* Heating firms tend to advertise the same things in the same way. If you give your advertising and sales promotion techniques a different twist, you'll find that the customers identify your company better, and that your name tends to stick in their minds.

For example, one firm sponsors what it claims is the longest radio broadcast put on. The program, a disc jockey broadcast of recorded music, goes on at ten at night, and doesn't conclude until dawn.

In another small town, the owner of a fair-sized heating firm appeals to customers from a trade territory stretching well beyond the town. But he has worked out an advertising scheme that lets him compete with success with big city firms that also advertise into the hamlets and small cities.

The Swap Column

This twist is the "Swap Column of the Air." It offers listeners a free medium on which they can offer any swap items they have.

Program format is simple. First, a transcribed opening musical theme, then an announcement of the purposes of the program. Next comes a fast commercial, followed by a reading of the listeners' swap offers.

Results, both for the sponsor, and for the listeners, have been phenomenal. Swap advertisers have been flooded with offers via telephone, often before the program leaves the air. And the sponsor's business has boomed because he found a way to achieve individuality for his company.

Working to make your firm stand out in a competitive business can pay off heavily in the long green. The public sees a similarity in most heating firms. It must be given a reason for buying in one rather than in another and it must be given some good reason for an impression that one is different from its competitors.

NEWS SUMMARY OF THE MONTH

Trade Practice Rules

THE OIL HEATING INDUSTRY of the New England States has cooperated with the Federal Trade Commission to develop a set of trade practice rules governing the sale, installation and service of heating equipment in that area.

While the rules are too lengthy to present in full, a listing of the general headings will clearly indicate the nature of the subjects that have been covered. The rules state that the following are unfair trade practices: Misrepresentation as to available supply of fuel oil; deceptive advertising; deception concerning rebuilt or second-hand products; misuse of the word "Free"; selling below cost; commercial bribery; use of "loss leaders"; discrimination; use of guarantees which are misleading; tie-in sales; defamation of competitors and finally, aiding or abetting use of unfair trade practices.

On the positive side, the commission recommends that each member of the industry keep accurate cost records and adhere strictly to the rules promulgated. While the trade practices were initiated voluntarily by the members of the industry, the rules are backed by the police power of the Federal Trade Commission.

Construction News

WITH THE PLACING OF 96,000 DWELLING UNITS under construction in the month of July, preliminary estimates indicate a total of 549,100 housing starts for the first 7 months of 1949. This figure is only 4 per cent under the total for a like period last year. Volume of apartment house construction has also been on the increase. Publicly-financed housing totaled 24,500 new units by the end of July compared to 7,300 for the first 7 months of 1948.

Announcement has been made by the Public Housing Administration of completion of arrangements for participation of local housing authorities in the six year program for providing 810,000 units of low rent housing. Application forms are being distributed and local authorities are to use these applications to make reservations of specific numbers of dwelling units from the national program. They may also be used to obtain preliminary loans from the Government to be used in starting plans.

The Public Housing Administration will make capital loans amounting to 90 per cent of developmental costs of a project and furnish cash subsidies each year to bridge the gap between rental income and actual operating expenses.

Request Pipeline to New England

THE TENNESSEE GAS TRANSMISSION COMPANY has filed an application with the Federal Power Commission in Washington seeking authority to extend its natural gas pipeline system to New England.

The company asked for a certificate of public convenience and necessity authorizing an increase in the

daily capacity of the system to 1,260,000,000 cu ft. The extension and expansion sought would cost an estimated \$94 million.

When completed into New England, the Tennessee Gas Transmission Company's system would be approximately 2142 miles long, 1759 miles of which have already been authorized.

The latest in a long series of moves first inaugurated by the company in October of 1947 to bring natural gas into New England was announced by Gardiner Symonds, company president. The company has been steadily building up its pipeline system to serve New England since that time and recently received a F.P.C. certificate of public convenience and necessity to extend its main transmission line from Morehead, Ky., near the present terminus, to a point near Buffalo, N. Y.

The company then promptly filed its application for authority to extend the system on from the authorized temporary terminus near Buffalo to Worcester, Massachusetts, a distance of 383 miles, from which terminus all six New England states can be served by distribution companies now handling manufactured gas.

Heating Controls on Television



R. H. JACOBS (left), manager of the school controls division of Minneapolis-Honeywell Regulator Company, explains the function of a thermostat in providing individual temperature control in classrooms to Walter Herlihy, who interviewed him on a television program on WJZ-TV, New York. Mr. Jacobs' talk dealt with the critical school housing situation.

Shipments of Aluminum

SHIPMENTS OF ALUMINUM WROUGHT PRODUCTS continued to decline during June, falling to 81 million pounds, the lowest point since March, 1946. The June shipments were 9 per cent below the 89 million pounds shipped in May and 43 per cent under the 148 million pounds shipped in June, 1948, according to the report issued by the Bureau of the Census.

Shipments 1948

Months	Shipments Historical % Per Mo.	ALL MANUFACTURERS			Act. %
		Residential	Comm-Ind.	Total	
Jan	5	39,176	2,683	41,859	9.9
Feb	5	22,356	2,460	24,816	5.8
Mar	5.5	16,507	2,290	18,797	4.4
Apr	6.5	20,892	1,954	22,846	5.4
May	8.0	23,975	2,083	26,058	6.1
Jun	8.75	25,907	2,041	27,948	6.6
6 Mos.	38.75	148,813	13,511	162,324	38.2
Jul	8.75	28,825	1,975	30,800	7.25
Aug	11.25	47,592	2,490	50,082	11.75
Sep	13.75	53,866	2,362	56,228	13.20
Oct	13.00	56,969	2,382	59,351	13.95
Nov	8.00	37,598	2,092	39,690	9.35
Dec	6.50	24,859	2,231	27,090	6.35
6 Mos.	61.25	249,709	13,532	263,241	61.8
Year	100%	398,522	27,043	425,565	100%

Industry Goal 1949

ALL MANUFACTURERS				% of Goal
Months	Residential	Comm-Ind.	Total	
Jan	25,000	2,500	27,500	5
Feb	25,000	2,500	27,500	5
Mar	27,750	2,500	30,250	5.5
Apr	33,250	2,500	35,750	6.5
May	41,500	2,500	44,000	8.0
Jun	45,625	2,500	48,125	8.75
6 Mos.	198,125	15,000	213,125	38.75
Jul	45,625	2,500	48,125	8.75
Aug	59,375	2,500	61,875	11.25
Sep	73,125	2,500	75,625	13.75
Oct	69,000	2,500	71,500	13.00
Nov	31,500	2,500	44,000	8.00
Dec	33,250	2,500	35,750	6.50
6 Mos.	321,875	15,000	336,875	61.25
Year	520,000	30,000	550,000	100%

Actual Shipments 1949

Months	ALL MANUFACTURERS			1949 to 1948
	Residential	Comm-Ind.	Total	
Jan	24,414	1,787	26,201	-38%
Feb	22,207	1,671	23,878	-4%
Mar	24,311	1,584	25,895	+38%
Apr	23,779	1,643	25,422	+11%
May	33,287	1,619	34,906	+34%

Oil Burner Shipments Climb

For the first 5 months of 1949 shipments of oil burners have exceeded shipments for a similar period in 1948. The actual totals were 136,302 in 1949 as against 134,376 in 1948.

The tables shown above were developed by the Oil Heat Institute of America to indicate the progress of the industry toward the 1949 goal of 550,000 oil burners. Although actual shipments for 1949 are below the projected 165,000 in the industry goal, activity in the field indicates that shipments will continue to rise.

Warm Air Furnace Shipments

MAY SHIPMENTS OF WARM AIR FURNACES totaled 42,427,

an increase of 23 per cent over the 34,595 units that were shipped in April, according to the Bureau of the Census, Department of Commerce. Shipments for the first 5 months of 1949 amounted to 183,378 as against 223,270 units in 1948.

Two trends are clearly visible in the breakdown of furnace shipments: gas heat is making a strong comeback and forced air units are increasing their percentage of sales. In the month of May, shipments of solid fuel furnaces accounted for 29 per cent of total shipments; oil fired units also were 29 per cent, while gas fired furnaces amounted to 42 per cent of the total. Forced air units were 60 per cent of the total shipments with the remainder being gravity flow furnaces.



RESIDENTIAL
AIR CONDITIONING
Section

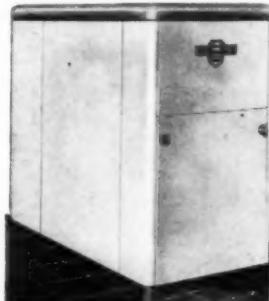
INDOOR COMFORT – IN ALL SEASONS
FOR HOMES AND SMALL BUSINESSES

A Waterbury Dealer Can Satisfy Every Customer!



For Every Size Home

Waterbury has a unit for every size home. If your customer wants to heat a cottage — or a large home, church or store — Waterbury can do the job.



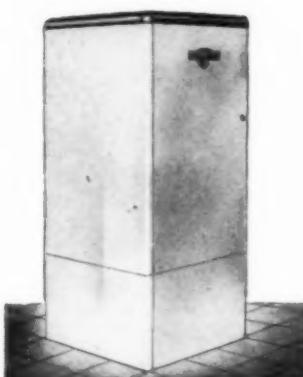
For Every Type of Fuel

Waterbury has a unit to fit your customer's choice of fuel — Coal—Oil or Gas — no matter what size unit he may require.



Regardless of Floor Space—Waterbury has units for basementless homes or homes where basement floor space is at a premium. All Waterbury units are designed for their special purpose.

It's Designed for the Job — All Waterbury units have efficient design — precision engineering — careful manufacturing. Each is backed by a reputation for sound workmanship that has stood the test of over 40 years!



Plus—

THE MASTER BLOWERTROL

We are convinced that this is the best means of achieving true continuous blower operation — it means more satisfied customers — the end of stratification and "Cold 70". Combined with precision-engineered Waterbury Air Conditioners, it is Modern Perfection in warm-air heating.

It's What's Under the Casing That Counts!

THE WATERMAN-WATERBURY CO.
1122 Jackson Street N.E.
Minneapolis 13, Minn.

Fundamentals Of Calculating Heating And Cooling Loads

PART ONE

JAMES J. LA SALVIA
Cleveland, Ohio

In this first installment of a new series, the author resolves the theory of heat transfer into simple terms and illustrates how heat losses for various types of wall construction are calculated. These fundamentals provide a necessary background for the engineering required to design the heating and cooling systems which are to follow.

HEAT is a form of energy. The higher the temperature the greater the energy. Therefore heat always flows from a higher to lower temperature. The flow increases as the difference between the two temperatures becomes greater.

This heat exchange occurs when there is temperature difference within a room, between rooms, and between the inside of a space and the outside atmosphere. Heat will flow until the temperatures are equal, then the flow will stop. When heat transfers from one space to another where it cannot be utilized, it is known as *heat loss*.

Economical heating in all types of buildings necessitates reduction of heat losses to a practical minimum. This is accomplished by improving wall, ceiling, roof, window, and floor construction. All building materials have a specific resistance to heat flow that has been established by test, and by applying two or more materials to form walls, ceilings, etc., resistance can be increased. This diminishes heat loss.

Heat Transmission

In order to determine heat losses through walls, ceilings, roofs, floors, and other parts of a structure, it is first necessary to find the rate of heat flow through the various materials incorporated into these elements. This rate is designated as the *coefficient of transmission*. Coefficients for practically all thicknesses and combinations of materials commonly used in construction are tabulated in books on heating.

Because of the many possible combinations of these materials, it is impractical to test each combination. When a combination which is not listed occurs it may be calculated. In such cases the coefficient of each material must be known. Manufacturers of building materials have this information available for the asking. Overall or air-to-air coefficients of transmission are calculated from the individual or component conductivities and conductances of the materials.

In order to properly understand the function of heating, it is necessary to know how heat is transferred. Heat is transferred in three ways: (1) Conduction, (2) Convection, and (3) Radiation.

Conduction is the transfer of heat from one body to another in contact with it, or in physical contact with an intermediate substance, due to a temperature gradient which exists between the bodies. The terms used for conduction in the heating field are the *thermal conductivity* and *thermal conductance*. In addition, there are the terms *resistivity* and *resistance*. Resistivity is numerically equal to the reciprocal of the conductivity, and resistance the reciprocal of conductance.

Convection is the transfer of heat to or from a body by the mass movement of a fluid in contact with it, such as the movement of a liquid due to a change of its density, caused by a change in temperature.

Radiation is the transfer of heat through space by rays, created by a temperature difference between two bodies, such as heat transmitted by the rays of the sun, an electric light, or an electric heater.

Thermal conductivity in the heating field expresses conductivity in Btu per square foot per hour per degree Fahrenheit per inch thickness. The inconsistency of expressing area in square feet and thickness in inches arises in the heating field because the thickness of common building materials is usually expressed in inches. No complications arise from this procedure when calculating transmissions through flat wall, except when conductivity is expressed per foot thickness, it is necessary to convert its value by dividing by 12.

Thermal conductance is the overall coefficient of conductance through material for its particular thickness expressed in Btu per square foot per hour per degree Fahrenheit. Materials such as hollow wall tile, consisting of several thicknesses of material and air spaces, are thus designated by a value that represents the rate of heat transmission between their surfaces.

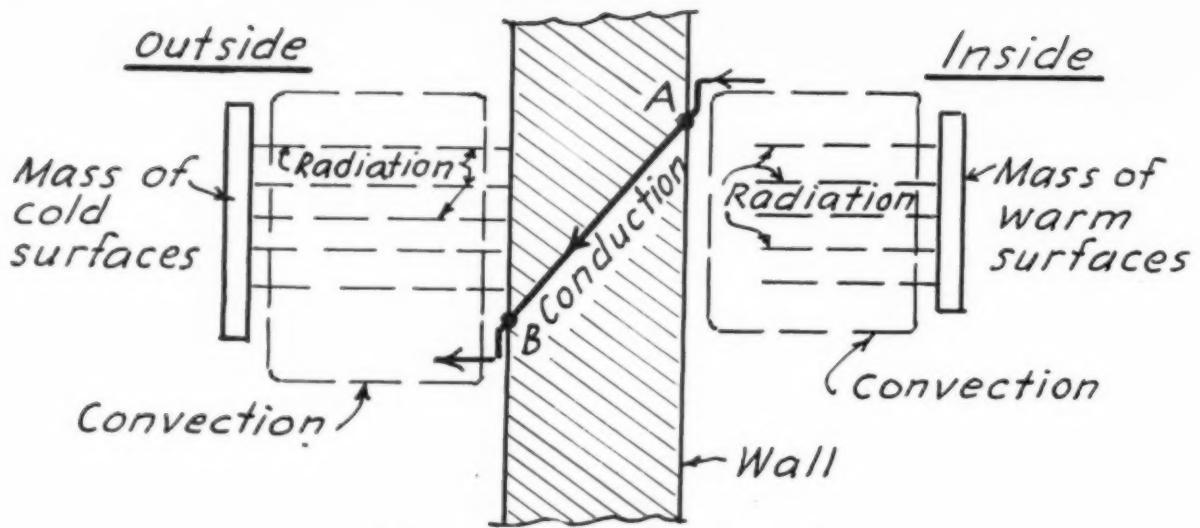


Fig. 1. Heat transfer through a homogeneous wall

The flow of heat through a material or a combination of materials as in walls is illustrated in Figs. 1 and 2.

Fig. 1 shows a simple homogeneous outside wall. Heat flows from the higher room temperature by convection, radiation, and some conduction to the wall, as to Point A. From Point A to Point B, through the wall, heat flows by conduction only. If the resistance of the material to heat flow is low, the slope of line AB would be less, and if high, the slope would be greater. From Point B, heat flows to the atmosphere, again by convection, radiation, and conduction.

Fig. 2 shows another type of wall having two homogeneous materials with an air space between them. As before, heat flows from the room to the wall by convection, radiation, and conduction: From Point A to Point B, heat flows by conduction only. From Point B to Point C across the air space, flow will be by convection, radiation, and conduction. From Point C to Point D, by conduction only, and from Point D to the atmosphere by convection, radiation, and conduction.

Heat Transfer Symbols

In order to simplify the calculation of heat losses of any structure the heating industry has adopted standardized symbols. The approved symbols and their definitions are as follows:

U = Thermal transmission or overall coefficient of heat transmission in Btu per hour per square foot of surface per degree F temperature difference between the air on two sides of a wall.

k = Thermal conductivity per inch thickness of homogeneous material in Btu per hour per square foot of surface per degree F temperature difference.

C = Thermal conductance through a non-homogeneous material in Btu per hour per square foot per degree F temperature difference, or through the actual thickness of a homogeneous material used commonly in construction.

f = Film or surface radiation, conductance, and convection in Btu per hour per square foot of surface per degree F temperature difference between the surface and the surrounding air.

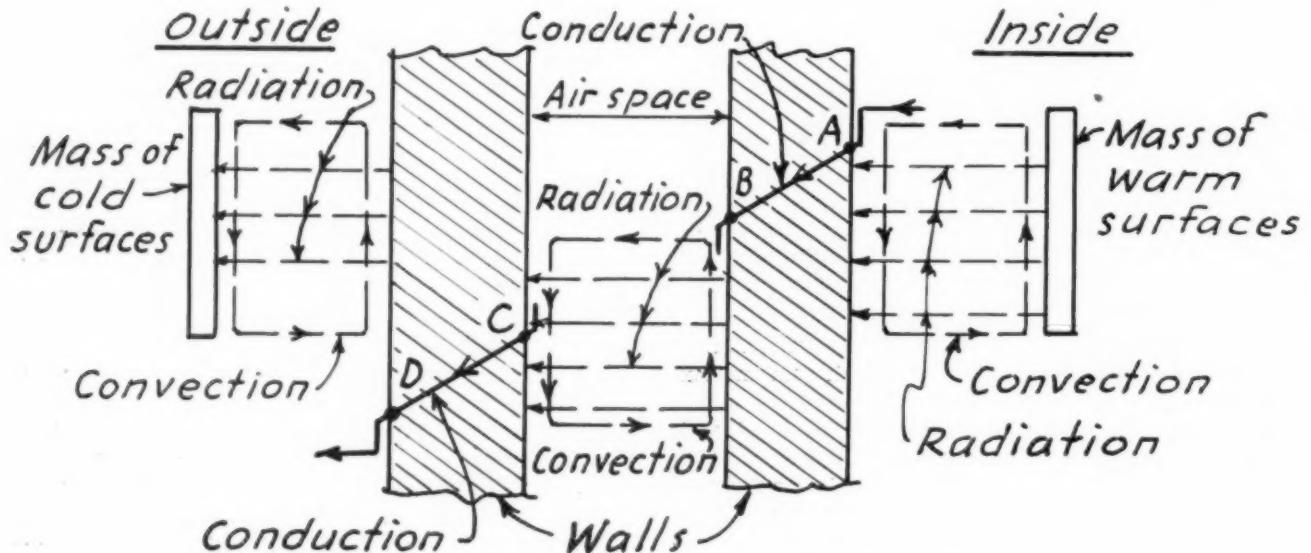


Fig. 2. Heat transfer through two homogeneous walls and an air space

a = Thermal conductance, radiation and convection through an air space in Btu per hour per square foot of surface per degree F temperature difference.

R = Resistance or resistivity and is numerically the reciprocal of transmission, conductance, or conductivity. Therefore the resistance **R** in each of the above cases is:

$$R = \frac{1}{U} = \text{overall resistance of a wall, air to air}$$

$$R = \frac{1}{k} = \text{internal resistivity}$$

$$R = \frac{1}{C} = \text{internal resistance}$$

$$R = \frac{1}{f} = \text{surface or film resistance}$$

$$R = \frac{1}{a} = \text{air space resistance}$$

The resistance $\frac{1}{f}$ can be broken down to $\frac{1}{f_o}$ and $\frac{1}{f_i}$ as the surface resistance of the inside and outside walls respectively.

$\frac{x_1}{k_1}, \frac{x_2}{k_2}, \frac{x_3}{k_3}$, etc., indicate the resistance through the component parts of the wall.

where: x = thickness of wall in inches

The total resistance to transmission of heat will be equal to the sum of the various resistances through surfaces and materials, as:

$$\frac{1}{U} = \frac{1}{f_o} + \frac{1}{f_i} + \frac{x_1}{k_1} + \frac{x_2}{k_2} + \frac{x_3}{k_3} + \text{etc.}$$

Using the same notations and transposing, the basic formula for the overall coefficient of transmission is:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{x_1}{k_1} + \frac{x_2}{k_2} + \frac{x_3}{k_3} + \text{etc.}} \quad (1)$$

When conductances are listed for definite thicknesses in which materials are regularly manufactured, instead of $\frac{x}{k}$ in the above equation insert the value $\frac{1}{C}$ as:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{x_1}{k_1} + \frac{1}{C_1} + \frac{x_2}{k_2} + \frac{1}{C_2} + \text{etc.}} \quad (2)$$

Likewise where an air space exists in construction,

TABLE NO. 1
Conductivity Values for Various Materials

Thermal conductivity (conduction only) in Btu per hour per square foot per degree F per inch of thickness.

Material	Thermal conductivity (k)	Material	Thermal conductivity (k)
<i>Rigid</i>			
Asbestos sheet	.29	Cement plaster	8.0
Balsa wood	.31	Cinder concrete	4.86
Celotex	.34	Concrete	12.6
Corkboard	.27	Concrete roof slab	3.98
Insulite	.34	Fiber	2.0
Masonite	.33	Glass, window	5.5
Wallboard	.50	Gypsum plaster	3.3
<i>Semi-rigid</i>		Haydite	3.96
Fibrofelt	.32	Limestone	14.0
Hairfelt	.31	Marble	14.0
Rockcork	.37	Slate	10.37 for roofing use $\frac{1}{2}$ " thick
<i>Flexible</i>		Stone	12.5
Balsam wool	.27	Tar, felt & gravel	1.33 use $\frac{3}{8}$ " thick
Dry Zero	.24	Stucco	12.0 use 1" thick
Kapok	.24	Tile or terrazzo flooring	12.0
Palco wool	.26	*Wood	.8 yellow pine or fir
<i>Loose fill or batt</i>		Wood (across grain)	.97—fir
Asbestos wool	.32	Wood (para. to grain)	2.42—fir
Glass wool	.27	Wood	1.15—maple or oak
Gypsum	.48		
Mineral wool	.27		
Rock wool	.28		
Wool—pure	.26		
Sawdust or shavings	.41		
<i>Masonry</i>			
Asbestos millboard	.84		
Brick—common	5.1		
Brick—face	9.2—assume veneer = 4"		
Brick—fire	4.1		
Cement & asbestos	2.7—use $\frac{3}{8}$ " thickness sheet		
Cement mortar	12.0		

*For shingles, clapboards and siding use $\frac{5}{8}$ "—for all other wood use as follows:

1" lumber use 25/32"

1½" lumber use 1-5/16"

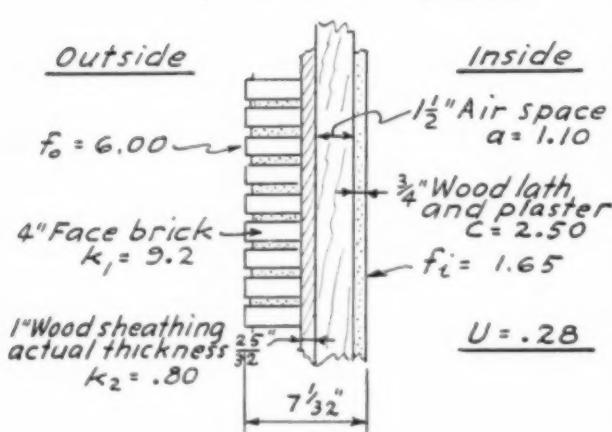
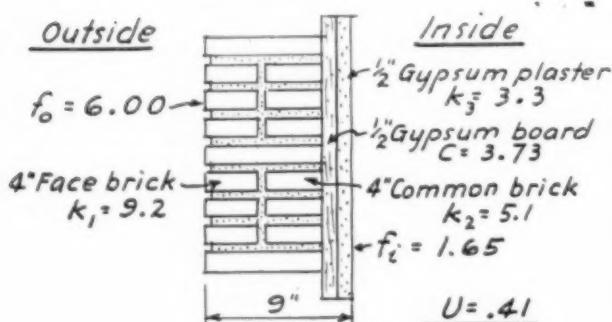
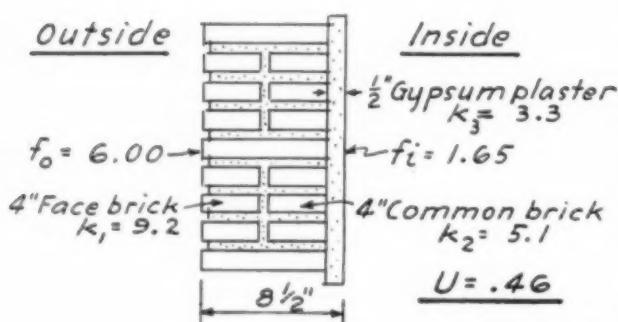
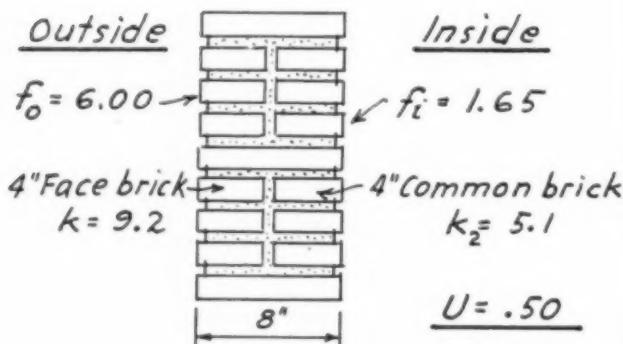
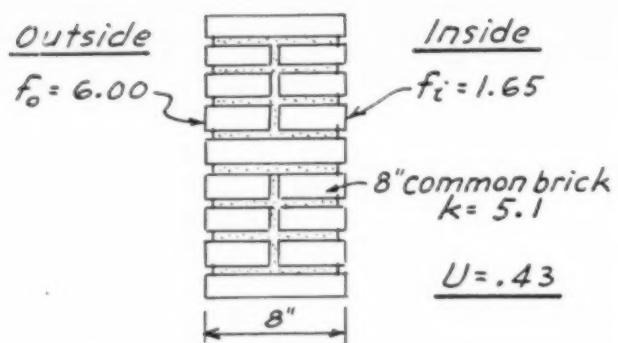
2" lumber use 15/8"

2½" lumber use 21/8"

3" lumber use 25/8"

4" lumber use 35/8"

For finish flooring use 13/16"



Figs. 3-4-5-6-7

the value of $\frac{x}{k}$ should be replaced by $\frac{1}{a}$ where a is the conductance for the given air space, as:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{x_1}{k_1} + \frac{1}{a_1} + \frac{x_2}{k_2} + \frac{1}{a_2} + \text{etc.}} \quad (3)$$

Many times, a common construction will consist of various materials. One may be noted by its conductivity; another that has definite thickness, by its conductance; and the wall also may include an air space. In this case, the equation becomes:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{x}{k} + \frac{1}{C} + \frac{1}{a} + \text{etc.}} \quad (4)$$

Coefficient of Transmission

To determine the overall coefficient of heat transmission U , it is necessary to obtain the conductivities or the conductances of the materials, the conductances of air spaces if required, and surface coefficients for still and moving air.

Factors are available for determining values of U at a wind velocity of 15 miles per hour. It is not necessary to calculate any other velocity than 15 miles per hour as a variation of 6 miles per hour either way will not change the overall coefficient of an average wall more than one per cent. In most cases, accuracy does not warrant other wind velocities.

Outside surface coefficients are always based on 15 miles per hour wind velocity and the inside surface coefficient on still air. When a coefficient has to be determined for a partition wall between two adjacent

TABLE NO. 2

Conductance Value for Various Materials

Thermal conductance (conduction only) in Btu per hour per sq ft per degree F for thickness of material given or as used on standard construction.

Material	Conductance	Thickness
Bright aluminum foil	.46	
3/4" air space faced one side	.41	
3/4" air space faced two sides	.23	
Single foil with 2-3/4" spaces	.15	
Double foil with 3-3/4" spaces	.06	
Asbestos shingles	.6.0	
Asphalt roofing	.6.5	
Clay tile	.64	6"
Clay tile	.60	8"
Clay tile	.58	10"
Clay tile	.40	12"
Concrete blocks	.90	8"
Concrete blocks	.78	12"
Cinder concrete blocks	.58	8"
Cinder concrete blocks	.53	12"
Glass blocks	.46	
Haydite blocks	.50	8"
Haydite blocks	.47	12"
Linoleum	1.36	1/4"
Metal lath & plaster	4.40	3/4"
Partition clay tile	1.0	4"
Partition gypsum tile	.46	4"
Plaster (1/2") on 3/8" plasterboard	2.40	7/8"
Wood lath & plaster	2.50	3/4"
Gypsum board	3.73	3/8"
Gypsum board	2.82	1/2"
Asphalt shingles	.6.5	

TABLE NO. 3
Conductance of Air Spaces at Different Mean Temperatures

Mean Temperature Difference (F)	Conductance of air spaces for various widths in inches						
	1/8	1/4	3/8	1/2	5/8	1	1 1/2
20	2.3	1.4	1.2	1.1	1.04	1.03	1.02
30	2.4	1.4	1.2	1.15	1.05	1.07	1.06
40	2.5	1.5	1.3	1.2	1.13	1.11	1.10
50	2.6	1.5	1.35	1.25	1.17	1.16	1.15
60	2.7	1.6	1.4	1.3	1.2	1.2	1.19
70	2.8	1.7	1.5	1.4	1.3	1.24	1.23
80	2.8	1.7	1.5	1.4	1.3	1.28	1.27
90	2.9	1.8	1.6	1.5	1.34	1.32	1.31
100	3.0	1.8	1.6	1.5	1.38	1.36	1.35

rooms of different inside temperatures, the inside surface coefficient is used for both sides of the partition wall.

Table 1 shows the conductivity k and Table 2 shows the conductance of various materials. Table 3 shows the conductance of air spaces for various widths in inches and Table 4, surface coefficients of various materials for outside and inside wall exposures. By using these tables the calculations for the overall coefficient of transmission U becomes a simple procedure.

Examples

The overall coefficient of heat transmission U for the walls shown in Figs. 3, 4, 5, 6, 7, 8, 9 and 10 may be calculated by the above equations and tables.

Example 1. Given an 8 in. wall of common brick as shown in Fig. 3. Since the wall is to be figured for 15 mph wind velocity, the outside surface coefficient f_o is 6.00 and the inside surface coefficient f_i for still air is 1.65, from Table 4. The conductivity k of common brick, Table 1, is 5.1.

From equation (1)

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{x}{k}}$$

$$U = \frac{1}{\frac{1}{6.00} + \frac{1}{1.65} + \frac{8}{5.1}} = \frac{1}{.167 + .606 + 1.568}$$

$$U = .43$$

Example 2. If the wall is changed from 8 in. common brick as in Fig. 3 to 4 in. face brick, conductivity k is 9.2, and 4 in. common brick, as in Fig. 4:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{4}{k_1} + \frac{4}{k_2}}$$

$$U = .50$$

Example 3. If $\frac{1}{2}$ in. gypsum plaster, conductivity $k = 3.3$, was applied to the inside surface of the wall as in Fig. 5:

$$U = \frac{1}{\frac{1}{f_o} + \frac{1}{f_i} + \frac{4}{k_1} + \frac{4}{k_2} + \frac{.5}{k_3}}$$

$$U = .46$$

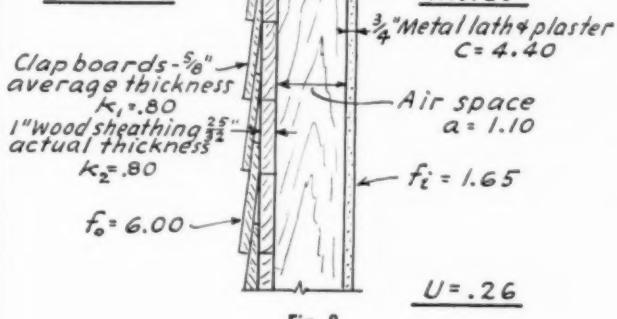
Example 4. Given a wall as in Fig. 6, consisting of 4 in. face brick, 4-in. common brick, $\frac{1}{2}$ in. gypsum board and $\frac{1}{2}$ in. gypsum plaster applied directly to the interior surface. The conductance C of $\frac{1}{2}$ in. gypsum board is 3.73.

(Please turn to page 170)

TABLE NO. 4
Surface Coefficients for Still & Moving Air

Surface	Still air (f ₁)	Moving air (15 mph) (f _o)
Average	1.65	6.0
Glass	1.50	4.50
Stucco		9.0
Bright aluminum	.80	

Outside



Outside

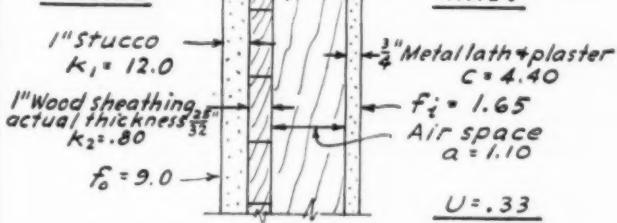


Fig. 9

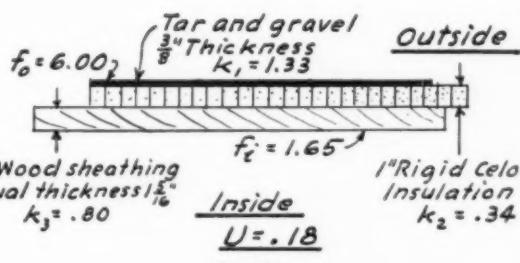


Fig. 10

Heating Basementless Houses with Warm Air

Design of Perimeter System

PART 2

S. KONZO* W. R. HEDRICK** and
J. M. DAVID***
University of Illinois

IN PART 1 of this series, the advantages and disadvantages of basementless homes were discussed in moderate detail and the authors expressed the opinion that the perimeter warm air heating system seemed to offer great possibilities for heating basementless homes. In this system, warm air is conveyed by ducts located below the floor along the outer edges, or perimeter, of the structure. The air is ultimately discharged, or bled, from the perimeter ductwork into the rooms through registers located either in the floor or baseboard. Up to this time, a number of installations have been made by heating contractors in various parts of the country without the guidance of a rational procedure for design. However, results reported by a number of independent sources indicate that room and floor surface temperatures have been highly acceptable to the occupants.

In this installment, a suggested design for a perimeter warm air heating system is presented. A number of assumptions that at present are only partially confirmed had to be made. The procedure therefore should be considered as tentative and subject to later modification.

The authors are indebted to the following men who have served on a special committee of the National Warm Air Heating and Air Conditioning Association to investigate the practicability of a tentative design procedure and who have offered many constructive suggestions during its development:

W. D. Redrup, Huntington, Indiana, chairman of the Installation Codes Committee,

C. W. Nessel, Chicago, Illinois, member of the Research Advisory Committee and chairman of a subcommittee for field investigations of new types of warm air heating systems.

C. L. Grandstaff, Elyria, Ohio, member of the Installation Codes Committee, and

R. W. Roose, special research associate in charge of warm air heating research at the University of Illinois in cooperation with the National Warm Air Heating and Air Conditioning Association.

Basic Assumptions for Suggested Design Procedure

Fig. 1 shows not only a floor plan of a typical perimeter warm air system, but also some of the arbitrary

limits that have been imposed. With any system as new as the perimeter warm air system for basementless homes, no single method of duct design can be expected. It has been necessary, therefore, to confine the design procedure to a specific type in order to make it possible to prepare a working table of simple form. For example, if it had been attempted to present a general design procedure that would apply to any size of house requiring any size and shape of perimeter ducts and any shape and size of registers, the authors would have arrived at an extremely complex procedure that would not have been practical. Since complete experimental proof of many assumptions is not available, it is necessary to introduce this procedure on a modest scale and with several limitations on the size of the applications.

The basic assumptions and limitations given in Fig. 1 are as follows:

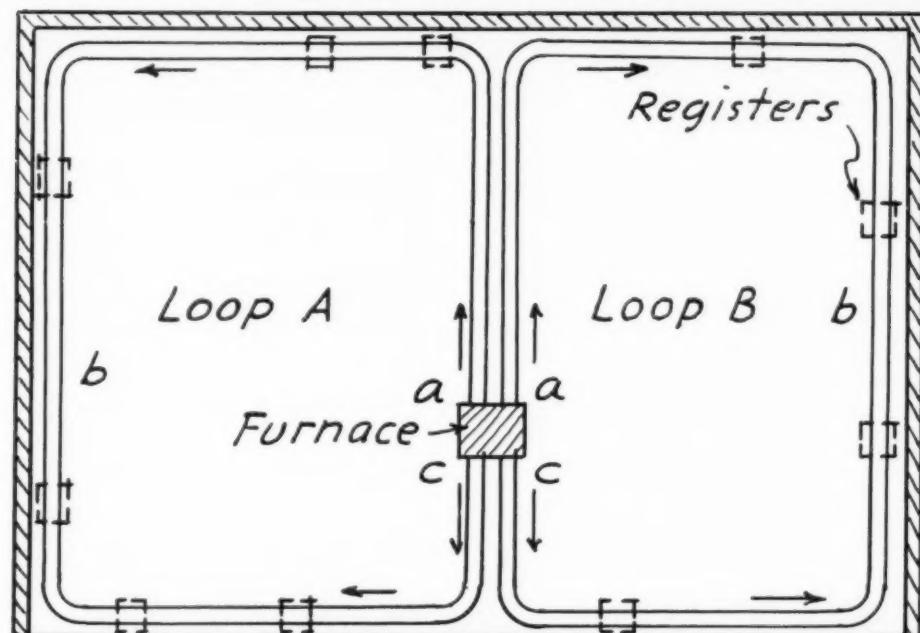
1. The procedure is to be limited to structures having a total heat loss of not greater than 60,000 Btu per hour. This loss also includes the rather significant edge loss from the slab floor to the ground and outdoor air.
2. As shown in Fig. 1, the warm air from the furnace feeds into two separate duct systems, designated as Loop A and Loop B, both of which are located in the slab floor. The air leaves the furnace as indicated by the arrows "a" and "c" and travels towards "b." In the perimeter system, warm air enters the loop at both ends and all of the air is eventually discharged into the rooms. The registers, commonly located in the floor, are indicated by dotted lines in Fig. 1.

It will be shown later that a further modification of the two-loop system is possible. This modification consists of a single loop with several feeder branches, or a wheel and spoke arrangement. However, for purposes of analysis the two-loop system shown in Fig. 1 is much easier to consider, and hence this discussion is largely based on the original scheme.

*Professor of Mechanical Engineering.

**Former graduate student, now with Surface Combustion Corp.

***Graduate student.



Building Plan

Limiting Conditions Assumed for Design Procedure

1. Total heat loss (including floor): 60,000 Btuh maximum
2. Loop capacity: not over 60 per cent of total. Two loops of approximately equal lengths. Length of loop (distance a-b-c) not over 90 ft. Size of perimeter duct: 8 in. diameter
3. Air temperatures: bonnet 165 F, return 70 F
4. Floor registers with: adjustable dampers, 300 fpm velocity. High wall (or ceiling) return intakes, 500 fpm velocity

Fig. 1 Perimeter Warm Air System—Basic Assumptions

For this design procedure the maximum heat capacity of any loop has been limited to about 60 per cent of the total capacity for both loops. The total length of the loop (distance a-b-c) should not exceed about 90 ft, and the two separate loops should be approximately of equal lengths. In addition, the perimeter duct is assumed to be an 8 in. diameter metal duct.

3. The temperature of the air leaving the furnace is assumed to be 165 F at design conditions. The temperature of the return air is assumed to be the same as that of the room air, namely 70 F. The temperature rise through the furnace unit is, therefore, $165 - 70$ or 95 F, which corresponds closely to the temperature rise used in testing and rating warm air furnaces. It should be noted that under actual operating conditions the air temperature from the bonnet will seldom attain a temperature as high as 165 F; first, because design load conditions will be attained on only a few days of the entire heating season, and second, because heat regains from the vent pipe, casing loss to the utility room, and unaccounted heat gains from cooking, lights, occupancy, and solar effects will all contribute towards making the actual operating temperature less than that assumed for design.

Furthermore, the fact that the design bonnet air temperature is in the order of 165 F does not result in floor surface temperatures of the same magnitude. In fact, as will be shown later, the surface

temperature of the floor immediately above the buried duct may be as much as 50 F lower than the air temperature in the duct. By careful location of the feeder ducts from the furnace to the perimeter duct, possible "hot foot conditions" can be avoided.

4. For the purpose of this design procedure it would have been possible to select any of the following alternatives as a basis for sizing registers:

- a. A single-sized register, allowing a wide range of air deliveries from it,
- b. Any size of register, also allowing a wide range of air deliveries, or
- c. Two sizes of registers, or free areas, and specifying the maximum allowable air delivery from each.

The latter was adopted and free areas of 45 and 60 sq in. were arbitrarily selected. A maximum velocity of 300 fpm through the free area was specified.

5. Return air intakes may be located close to the furnace and are usually placed on the high sidewall or ceiling. These locations seem at variance with common practice in warm air heating, however, it should be realized that when air is introduced near the outer wall and is discharged upwards, it mixes with the cool air coming down the walls and windows so that uniform temperatures prevail from floor to ceiling. No pool of cool air exists near the floor. Return air intakes may be located at the most convenient point, which in most cases will be

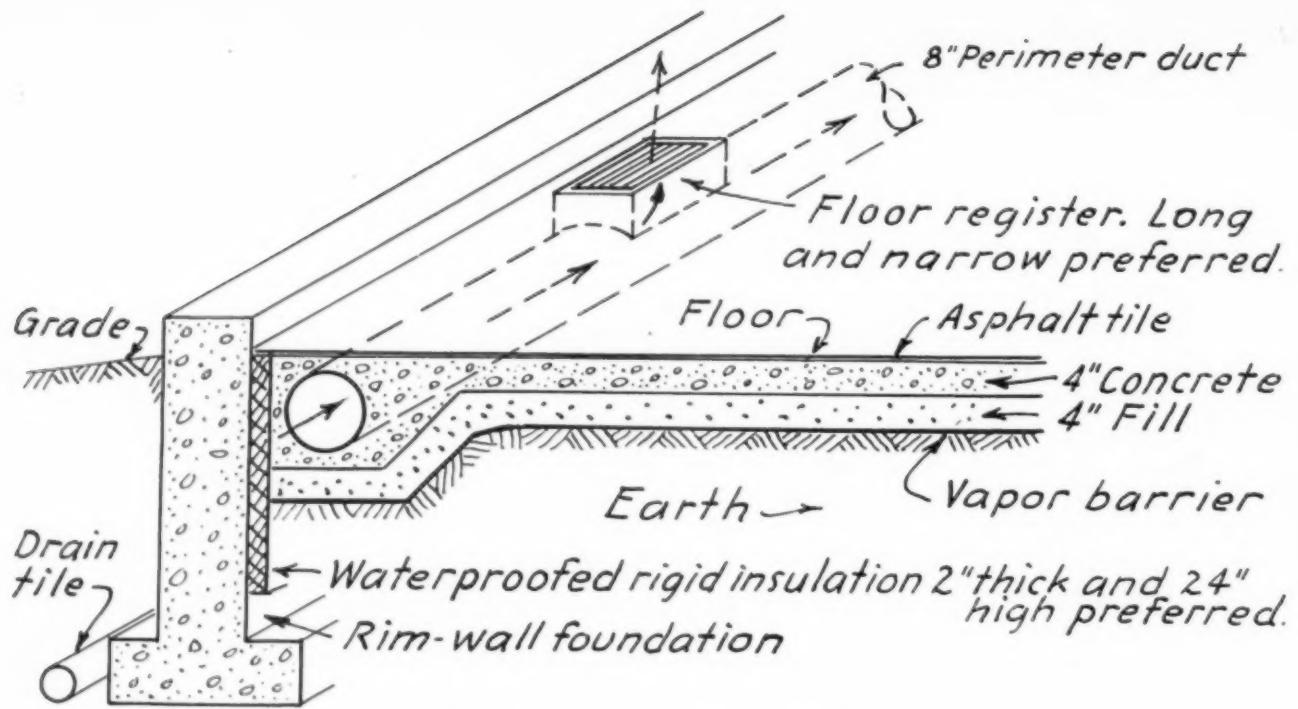


Fig. 2 Construction details of perimeter duct.

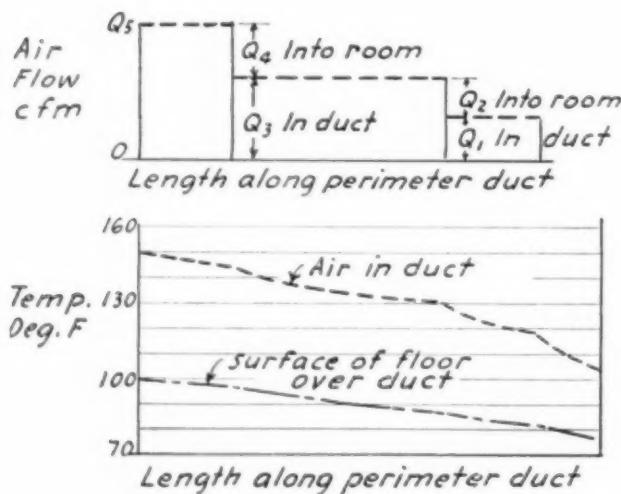
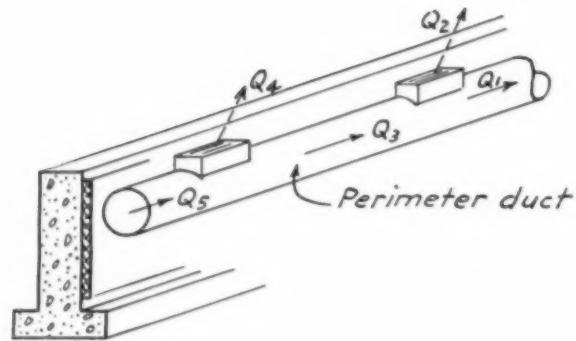


Fig. 3 Diagrammatic representation of air flow and temperatures in perimeter duct.

on the high sidewall adjacent to the furnace room. Little advantage, if any, is gained by trying to return air from the outside wall or from the lower part of the room.

Construction of Floor Slab and Perimeter Ducts

The fact that the ducts carrying heated air are within a few inches of the cold exposed wall should be sufficient warning that adequate insulation or the floor slab is mandatory. Concrete is a good heat conductor, so good in fact that if the perimeter ducts are not insulated, the escape of heat from the edges of the floor slab will not only melt snow from the foundation walls, but will provide ideal growing conditions for early spring bulbs planted near the foundation. Most homeowners are, however, like the individual who stated most vehemently: "I am not interested in tulips." The recommended construction of the floor slab is shown in Fig. 2, which incorporates many of the suggestions given in Circular F 4.3 of the University of Illinois Small Homes Council, entitled Concrete Floors for Basementless Houses. Although the use of 1 in. edge insulation is common, 2 in. thickness is preferred, not only from the standpoint of fuel saving, but also from the fact that if the warm air in the perimeter duct is cooled by the edge loss, the rooms at some distance from the furnace will be more difficult to heat. It is the obligation of the heating contractor to educate builders and homeowners to this level of construction practice. Fig. 2 also shows the use of a vapor barrier. According to Circular F 4.3, the vapor barrier should be "provided to prevent the rise of moisture from the ground into the floor slab. This barrier should be placed over the fill (or below it), and extended to the outside edge of the floor area. The membrane used as a moisture barrier must be suffi-

ciently strong to resist puncturing during the pouring of the concrete floor. A rigid asphalt board (approximately $\frac{1}{8}$ in. thick) or a reinforced duplex paper with asphalt center is acceptable." The sheets should overlap about four inches and should preferably be tarred along the lap. This vapor barrier is mandatory with a perimeter warm air system and should extend completely below it and be carried up the foundation wall. Any ground moisture that seeps into the perimeter duct may cause difficulties. In Fig. 2 is also shown a tile for drainage located on the outside of the foundation. This tile is essential when the house is located in a low area or where ground moisture is plentiful. It is frequently omitted in those areas where ground drainage is satisfactory.

In practice, perimeter ducts have been constructed of galvanized sheet metal, black smoke pipe, or bare concrete. In the latter case, wooden forms are often used for the construction of a rectangular perimeter duct. When metal ducts are used as a form, they are commonly of 24 or 26 gauge. Galvanized ducts are preferable to black, although rusting of the metal would probably not cause much added resistance to air flow. Fig. 2 shows concrete completely surrounding the perimeter duct so that in case of metal deterioration no chance for air leakage will occur and little possibility exists for entry of moisture. It has been found desirable when pouring a concrete slab to anchor metal ducts with metal ties or stakes so they will not float.

Air Flow and Air Temperature Decreases Along the Perimeter Duct

The warm air from the furnace is fed downwards into a collecting pit, or subfloor plenum, to which are connected four 8 in. pipes leading out towards the edges of the building. As shown in Fig. 3, the heated air travels through the perimeter duct, which is in close proximity to the outside foundation. Air is bled off at intervals in the perimeter duct and discharged through registers into the rooms where it finally cools to room air temperature. The diagram in the middle of Fig. 3 shows the relative quantities of air flowing through the perimeter duct and those entering the room.

Under design conditions, which will seldom be attained in actual operation, the heated air from the bonnet leaves at a temperature of 165 F. Before the air reaches the perimeter it will cool slightly in its passage through the feeder duct, since some heat transfer will occur to the floor and the ground. As shown in the bottom diagram in Fig. 3, the air temperature in the perimeter duct continually decreases along the path of air flow. The rate at which the temperature of the air decreases will be greater than that of air passing through galvanized ducts suspended in air. As the air temperature decreases along the perimeter duct, the temperature of the floor slab also decreases. In addition, as air is bled off at the register into the room, the quantity of air continuing down the remainder of the duct is decreased. Since a small quantity of air flowing down the 8 in. pipe will cool faster than a large quantity, the rate of temperature drop is not uniform along the duct and becomes of considerable magnitude towards the end of the half

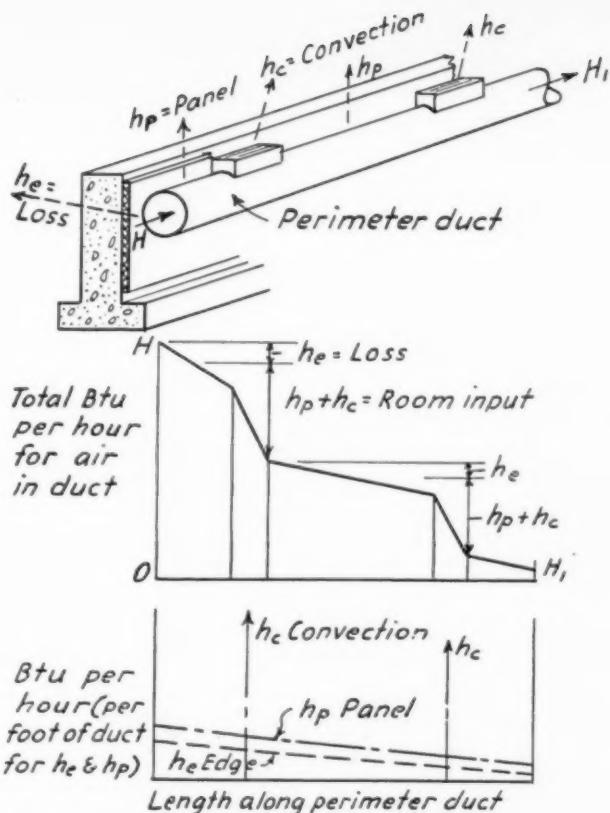


Fig. 4 Diagrammatic representation of heat flow in perimeter duct.

loop. Hence, air discharged from a distant register will be at a lower temperature than that from a register nearer the furnace and a greater quantity of air will be required for a given heat loss.

One cannot escape the conclusion that it is desirable to be able to predict the air temperature in the various parts of a perimeter system. It is also necessary that the heat loss from the perimeter duct to the outdoors be minimized. A large edge loss will increase the fuel consumption and in some cases it may mean that the system cannot be made to operate properly without considerable adjustments in balancing, because distant rooms will be supplied with air that is too cool.

Edge Loss and Panel-Convection Heating Effects

Heat is transferred from the air in the duct, not only to the floor surface above the perimeter duct, but also to the outdoors through the foundation walls. As shown in Fig. 4, h_e represents the edge loss, which is not available for supplying the heat requirements of the building. The diagram at the bottom of Fig. 4 shows that the edge loss diminishes along the duct. That portion of the heat which warms the floor surface above the duct is labelled h_p , or panel heating effect. The magnitude of this effect also diminishes along the duct, because of the decrease in air temperature. The panel effect is not large in comparison with the convection effect, labelled as h_c . However, even though the panel heating effect is small, the placement of the heat source close to the outer wall should effectively counteract the tendency for a cold floor near the outer walls of a building. The manner in which the heat available in the air decreases along the duct is shown by the middle diagram in Fig. 4. At

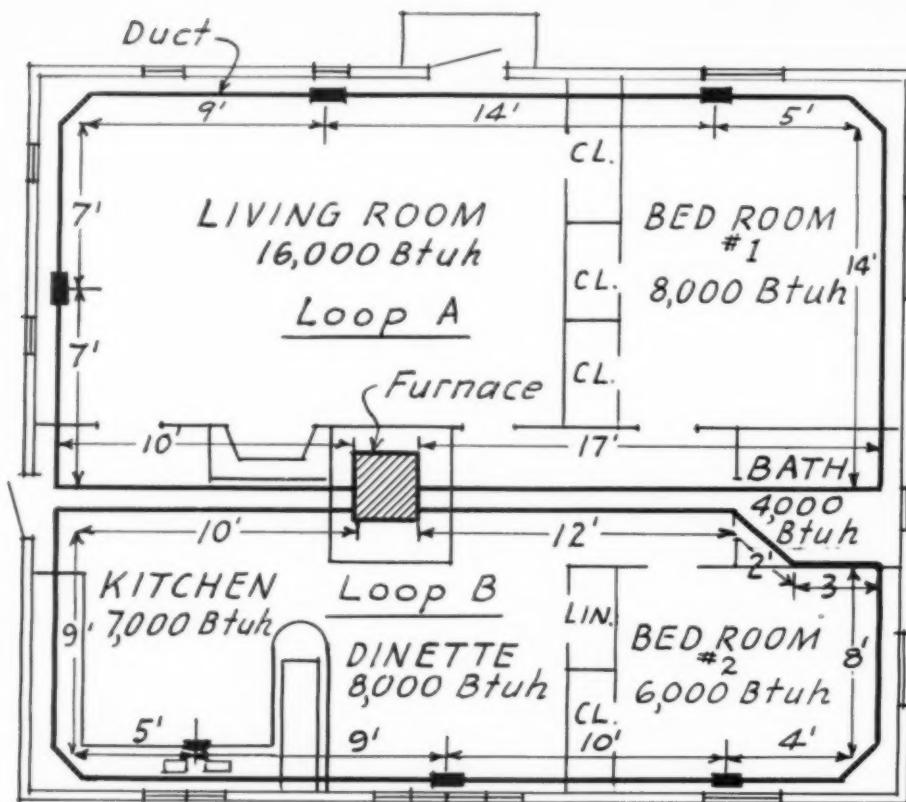


Fig. 5 Example of Perimeter Warm Air System

Table 1. Register Delivery in Btu per Hr.

Distance from Bonnet to Register, Ft.	Register Delivery in Btu per hour for Register Having Free Area Opening of	
	45 sq in	60 sq in
0-28	8,200	10,300
29-45	6,100	8,100

Table 2. Recommended Register Sizes

Recommended Register Sizes for Free Area Opening	of 45 sq in.		of 60 sq in.	
	14 x 4		14 x 6	
	or 10 x 6	or 10 x 8	or 10 x 12	or 12 x 14

the end of the run the available heat is low. The design procedure suggested in this series of articles attempts to consider the heat available at various distances from the furnace. The tabular values which will be shown later include both the panel heating effect and the convection heating effect.

Preliminary Steps in Layout of Duct System

Three simple steps are necessary in determining the location of the two loops comprising the perimeter warm air system and the location of the registers:

First step: Heat Loss From Rooms

Calculate the heat loss from each room to be heated. These heat losses shall include only the losses of walls, ceilings, windows, and infiltration,

(Continued on page 164)

Table 3. Return Air Sizing Table

Combination No. R.A.*	51	52	53	54	55	56	57
Btu per R.A.	4400	8100	10,800	13,700	16,200	21,600	54,000
Intake and Duct Size	8x10 or 4x14	8x10 or 4x14	9x12 or 6x14	9x12 or 6x14	10x12 or 6x30	12x14 or 6x30	12x20 or 8x30

*Refer to Table 12, Page 27, Manual No. 7.
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Table 4. Work Sheet

1. ROOM	Living	Bed No. 1	Bed No. 2	Kitch.	Dining	Bath			Total										
HEAT LOSS LOOP A	16,000	8,000	X	X	X	X			24,000										
2. HEAT LOSS LOOP B	X	X	6,000	7,000	8,000	4,000			25,000										
3. REGISTER SELECTION	D. F.A.	O.	D. F.A.	O.	D. F.A.	O.	D. F.A.	O.	D. F.A.	O.	D. F.A.	O.							
	17	45	8,200	36	60	8,100	29	45	6,100	24	45	8,200	33	60	8,100	14	45	8,200	
	33	60	8,100																
TOTALS	105	16,300		60	8,100		45	6,100		45	8,200		60	8,100		45	8,200		
4. REGISTER SIZES	14x4		14x6		14x4		14x4		14x6		14x4								
	14x6																		
5. RETURN AIR INTAKE SIZE	6x30		4x14		4x14		4x14		4x14										

Line No.	Procedure	Explanation	
1.	List the names of the rooms to be heated.	In the example, the living room with a heat loss of 16,000 Btu per hour and bedroom No. 1 with a loss of 8,000 Btu per hour are included in Loop A for a total loop capacity of 24,000 Btu per hour. The total heat loss of rooms in Loop B is 25,000 Btu per hour.	and convection heating effects.
2a.	Enter the room heat loss for rooms included in Loop A. Show the total heat loss for the loop in the last column.	No loop shall have a total requirement of more than 60 per cent of the heat loss of the entire house. Thus, in this example, neither loop shall supply more than 60 per cent of 49,000, or 30,000 Btu per hour. See later discussion for methods of equalizing loops.	At the bottom of line 3 is a space marked TOTALS. Show the totals for each room.
2b.	Repeat the above steps for rooms included in Loop B.		
3.	Three columns are shown under each room. In the column designated D. for DISTANCE, enter the shortest distance from the bonnet to register. In the column designated F. A. for FREE AREA, enter the free area requirement obtained from Table 1. In the third column designated OUTPUT, enter the register capacity in Btu per hour, as obtained from Table 1. This output includes both panel	There will be both a short and a long distance from the bonnet to any given register. Use the short distance, measured along the duct. Show measurements to the nearest foot. For example, register No. 1 in the living room is 17 ft from the bonnet, and register No. 2 is 36 ft. The single register in bedroom No. 2 is 36 ft from the bonnet. A register having a free area of 45 sq in. and located 17 ft from the bonnet will have an approximate capacity of 8,200 Btu	per hour. Also a register with a free area of 60 sq in. and located 33 ft from the bonnet will have a capacity of 8,100 Btu per hour. These two registers will supply the heat loss requirements of the living room.
4.	Enter the register size which will give the required free area. See Table 2. These are approximate and will differ slightly from data in manufacturers' catalogues. Note that the long dimension of the register is to be in line with the perimeter duct.	The sizes listed in Table 2 are currently available. A long and narrow register, installed with the long dimension in the direction of air flow in the perimeter duct, may be preferable to the wider sizes listed. Also see discussion on register types and sizes to follow.	If additional, or fewer, registers are needed than were tentatively selected from the preliminary steps, it will be necessary at this point to use the correct number, relocate them, and repeat the procedure in line 3.
5.	Enter the size of the return air intake required. Determine first whether a given intake is to collect air from one or more rooms. Obtain required intake sizes from Table 3.	The example shows individual returns from all rooms except the bathroom. In normal practice the number of intakes for the entire house will be small, usually not over two. A single return intake of 8 by 30 in. may be selected for the example.	

Third Research Residence Nears Completion

POURING of the concrete slab floor in one of the most significant small homes now under construction was completed on July 15th.

Nearing completion, this house, known as Research Residence No. 3, is being built by the National Warm Air Heating and Air Conditioning Association at Urbana, Illinois, to test the most suitable low-cost heating systems for homes in the \$6,000 to \$10,000 price range.

Typical of Today's Construction

Realizing that a large percentage of residential construction today is for families having an annual income of from \$2,500 to \$4,000, the association designed this house to keep it as typical as possible of those currently being built. Storm windows, weatherstripping or wall insulation have not been specified though storm doors are provided. Although not approving this type of sub-standard construction which saves immediate cost only to cause long-continued expense in increased operating cost, the association recognizes that this is the prevailing practice in low cost construction and that it is a problem which the heating contractor is meeting in an ever increasing degree. Therefore, testing will be conducted for the purpose of determining how to overcome these hurdles as economically as possible. The heat loss is 60 Btu per square foot, the maximum allowed by FHA.

As illustrated in Fig. 1, residence No. 3 is a 4½ room basementless, slab-on-ground type of house of standard frame construction above ground. The exterior walls are cedar shingles; the inner sides of the exterior

walls consist of 3/8 in. gypsum board with aluminum foil backing. The ceiling is 1/2 in. gypsum board with aluminum foil backing to serve as a vapor barrier and has 4 in. mineral wool insulation above. The hallway is furred down 12 in. in order to accommodate a plenum to be used with the heating systems.

The pouring of the concrete slab was one of the last major construction operations performed on the new residence. All that is required to complete the house before the winter season test program begins, is the erection and finishing of the interior walls, and the decoration and furnishing of the rooms.

The heat transmission, coefficient U , of the exposed walls is 0.212 Btu per hour per square foot per degree F. Using a design temperature of -10 F the heat loss for the home is 42,528 Btu per hour above ground and 6,367 Btu per hour through the slab.

Testing of Warm Air Panel Heating

Four different heating systems will be tested in the residence during the 1949-50 heating season. First to be tested will be a peripheral, or perimeter, system in which warm air ducts are contained in the concrete slab. These ducts, which are in a form of two loops (Fig. 2), lead from a pit below the furnace toward the outside walls and then parallel the outside walls so that the loops enclose practically the entire floor area.

Fig. 3 shows the manner in which the perimeter duct is installed in the slab as well as construction details of the slab, foundation, walls and ceiling. The duct (8 in. round) is placed 2 in. below the top surface.

(Continued on page 158)



Fig. 1 The floor plan of research residence No. 3 which will be used to test four separate heating systems during the 1949-50 heating season.

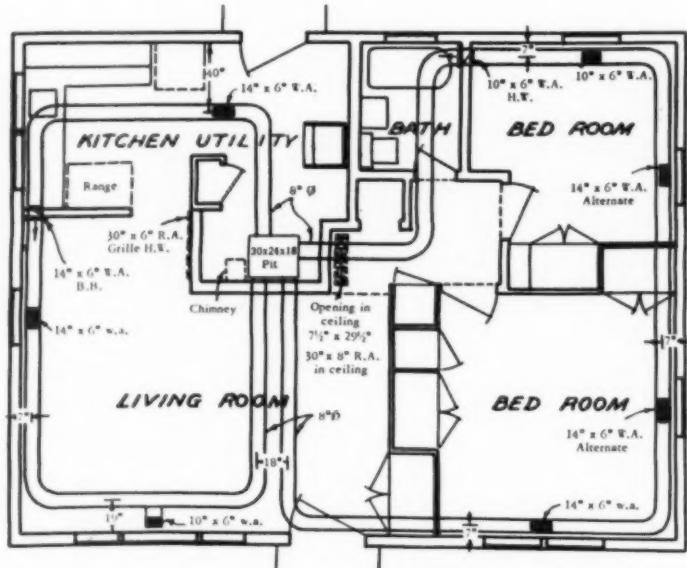
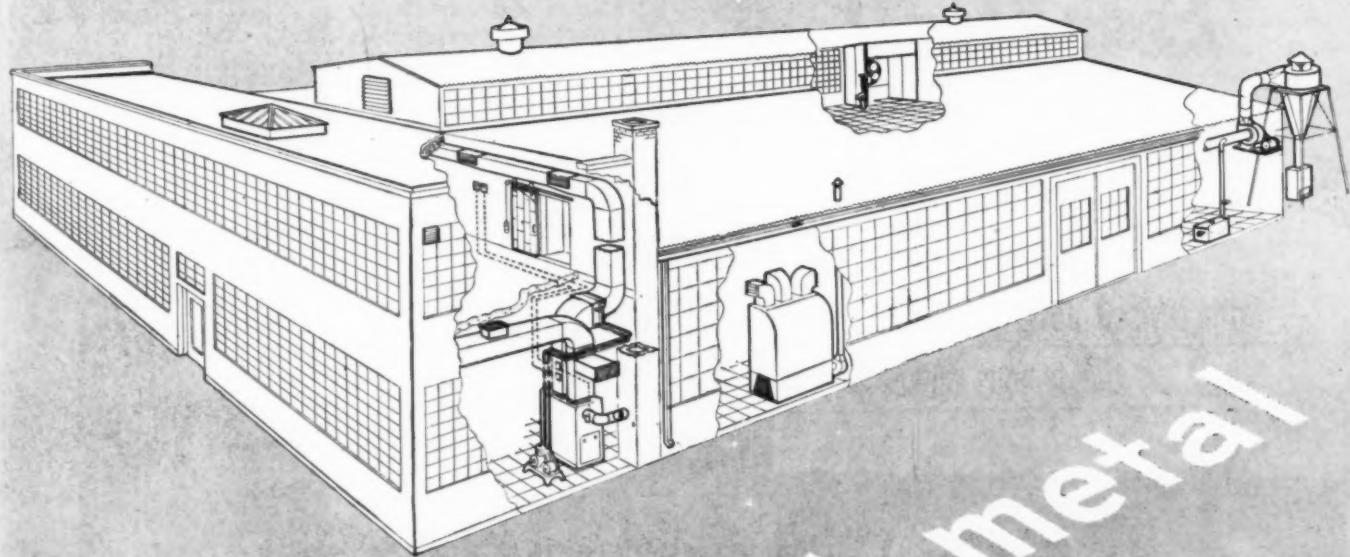


Fig. 2 The two loops formed by the 8 in. round ducts around the outer perimeter of the house and the location of the warm air registers and return air openings.



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San Diego, California

H. E. McNeil of San Diego, California, really gets around. For the past several years he has traveled nearly 60,000 miles annually, inspecting his construction work and seeking scarce materials.

In March, 1948, he purchased an airplane to reduce travel time, and now regards it as one of his wisest investments. In addition to sheet metal work, McNeil is also licensed to contract for heating and ventilating. Although this range of activities keeps him on the road more than the average contractor, he's convinced that a plane can be a paying proposition to any business man who finds it necessary to leave town frequently.

"I look at flying from a purely economic viewpoint," Mr. McNeil comments. "Air travel is rapidly approaching trains and automobiles as a standard mode of transportation. The day of hedge-hopping youngsters is definitely past. Simply because I refuse to take chances, I feel just as safe in the air as I do on the ground."

Mr. McNeil's plane is an all-metal Beachcraft Bonanza, capable of cruising at 170 miles per hour. It has a two-way radio, a direction finder to make navigation a simple job, and various safety devices to reduce the hazard of accidents. If he approaches a runway without first lowering the wheels, for instance, a warning buzzer sounds so he won't go in for the landing.

The contractor has about \$11,000 invested in his ship, which sounds like a great deal of money to those

accustomed to driving a car. But Mr. McNeil contends that instead of being expensive it's really an economy. For evidence he points to the figures of an eastern corporation which conducted a test analysis on the expense of flying employees in its own plane a distance of 25,000 miles. Results showed that after taking everything into consideration the cost was only 1.8 cents per mile.

In addition to the financial aspect there are other advantages almost as important. Unless Mr. McNeil is making one of his infrequent trips to the middle west to purchase supplies, he never has to be away from home overnight. He can go to San Francisco, Salt Lake City, or Phoenix and be back with his family that same evening.

That not only adds to his home life but makes his work at the office much easier. No need now to leave detailed directions because he's making a trip, he'll be back in time for any decisions which come up. Furthermore, he doesn't have any problem in taking care of out of town business which can't be settled by correspondence or telephone. When he feels he should make a trip, he does it without any strain or bother.

There are drawbacks, of course. There is a certain percentage of the time that he is grounded by weather conditions. Then there's always the question of transportation when he arrives at his destination. Mr. McNeil solves this by renting a car.

Despite these disadvantages, he can't understand how he ever managed to get along without an airplane.

Mr. McNeil in the cockpit of his plane





Fig. 1 This chart is used by Lumbermens Mutual to show the impact of indirect expenses in an accident. See text.

Safety Pays!

Purpose of this article is to show the dollar and cent side of a safety program for the heating or sheet metal shop. Acknowledgment is gratefully made to the National Safety Council, Lumbermens Mutual Casualty Company, and Hardware Mutual Casualty Company for assistance in preparing this material.

EVERY time you file a claim arising from an accident covered by workmen's compensation insurance, you incur a financial loss.

Normal reaction to this statement is that compensation insurance amply protects an employer against loss from legal claims of employees for medical and hospital expenses, indemnities, and wages resulting from accidents that cause bodily injury or disability. By being protected against these direct liabilities, many employers overlook the indirect costs of accidents and become complacent toward ever-present occupational hazards.

Insurance companies have estimated that the indirect losses from an accident are four times the amount

of the direct and legal liability.

How do they arrive at this ratio? Statistics show that the *average* occupational accident costs \$250. The *average* workmen's compensation insurance claim is \$50, representing the direct legal liabilities. But the *average* indirect costs are estimated at \$200. The latter represent the costs from damage to equipment and property, cost of hiring and training new workers, and loss in the rate of production. The effect of these factors can be readily envisioned, such as the absence of one or several employees causing a decrease in production until their return or replacement. Such losses are indirect because they do not involve direct payment, yet vital because they influence rate of production.

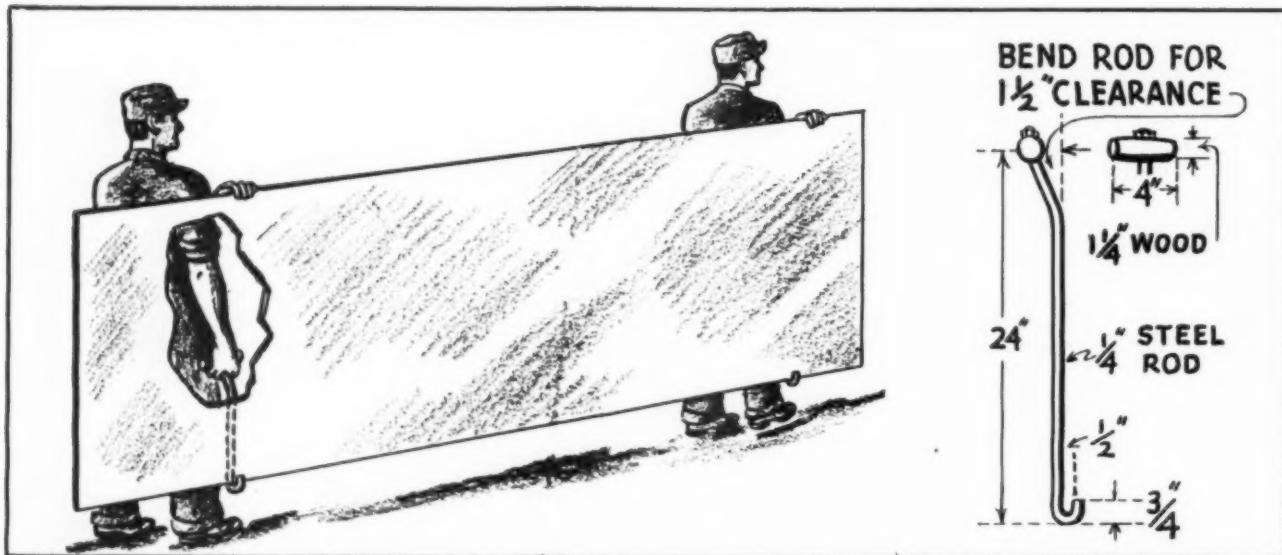
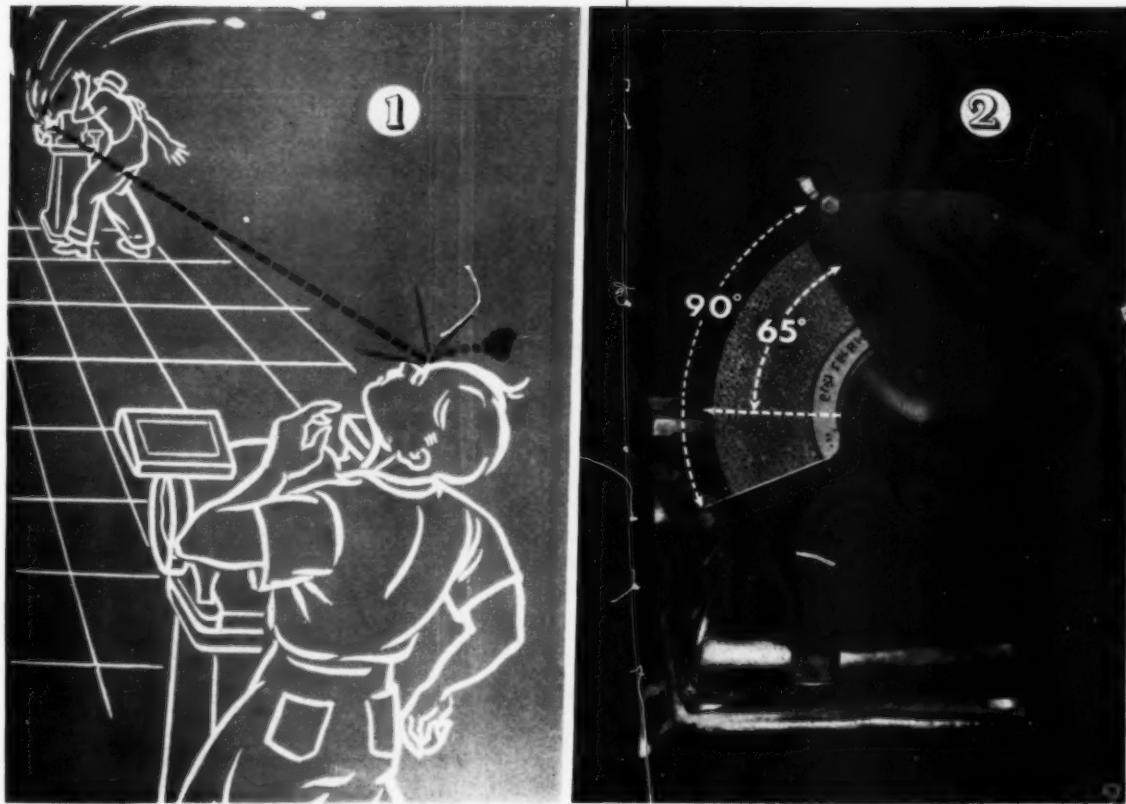


Fig. 2 A handy hook which can be put to good use in the sheet metal shop. It helps greatly in reducing hand injuries.

Nat'l Safety Council



Nat'l Safety Council

Fig. 3 Wheel explosions are likely to injure more than the man who is directly in front of the wheel. On the right are shown the correct positions for the tool rest and wheel guard.

Since accidents cost money, let us consider what can be done about reducing them. First, let us study the types of accidents that occur in heating or sheet metal shops and means of preventing them. Then we can analyze a table of typical rates of compensation for injury or loss of life and determine what the premium costs are for compensation insurance, across the country. A program of safety procedure will be presented to cut the incidence of accidents and thus save money directly and contribute to lower premiums for compensation insurance.

One of the largest companies in the field of compensation insurance has developed a table of accident frequency in sheet metal shops which looks like this:

Handling objects	26.8
Eye injuries	19.6
Stepping on or striking against.....	14.8
Falls	10.9
Use of machines	8.4
Falling objects	7.6
Hand tools	5.8
Other (vehicles, etc.)	6.1

100.0 per cent

It might be well to point out before proceeding that this table refers only to the number of accidents and not to their gravity or expense.

During the productive operations in a sheet metal shop it is necessary to handle materials at so many stages that the frequency of injury from this cause is understandable. Muscular strains, injuries to limbs and other consequences of improper handling of mate-

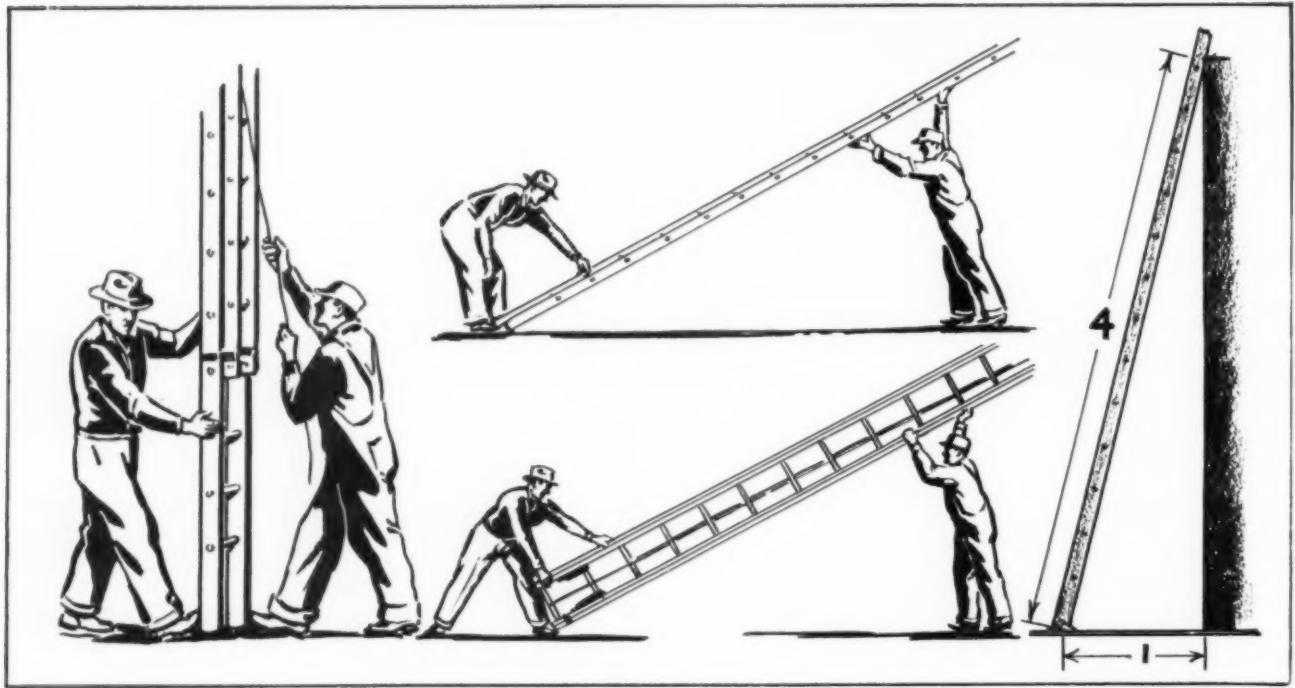
rial are often observed around the shop. So, the most effective way of guarding against injuries of this nature is to make sure that every worker has a thorough knowledge of the correct technique of lifting. Lifting beyond an individual's strength accounts for many of these injuries and it might be wise to set limits on what weight men should lift. Some states have taken this action with good results.

Hand and finger injuries often result from handling rough or sharp edged material. An illustration shows a convenient hook for carrying large metal sheets that is particularly useful in a sheet metal shop. Hand leathers and gloves also minimize the danger of these mishaps. Use of mechanical handling equipment such as portable or overhead cranes may be economically feasible in the larger shops.

Eye Injuries Are Second

According to the table, eye injuries rank second in the sheet metal shop and may derive from several sources. Grinding, buffing, chipping, riveting and chiseling cause many injuries. Another shop hazard is welding, whether spot, electric arc or oxyacetylene. Soldering, a similar operation, is dangerous because of the splattering of acid or flux and hot metal.

A basic method of preventing such accidents is, of course, use of properly-fitted goggles. Importance of comfortable safety goggles cannot be overemphasized because many injuries are sustained when men are wearing goggles but have shifted them or taped the nosepieces and thus raised the goggles from the face. In an attempt to make the glasses more comfortable



Nat'l Safety Council

HOW TO DESCEND A LADDER-- IN TWO STEPS--



Nat'l Safety Council

the men expose themselves to flying particles which can enter the eye through the opening produced. All stand grinders should have eye shields and all portable grinding or buffing equipment should be fitted with guard hoods. Goggles and face shields will also reduce the danger inherent in welding and soldering.

Faulty mechanical equipment can be charged with the responsibility for many eye injuries. Grinding

Fig. 4 Raising an extension ladder is a two-man job. The drawings illustrate the correct procedure. The sketch at the right shows the proper ratio of base to height in using a ladder.

Fig. 5 The cartoon at the left is not quite so funny to the workman who suffers such a mishap.

wheels which have not been properly handled and maintained may explode and cause serious damage. As the illustration shows the danger is not restricted to the man at the grinder but can extend to a worker nearby. Dressing the wheel improperly or running it at a speed higher than recommended by the manufacturer can result in a wheel explosion.

Injuries caused by stepping on or striking against objects may often be due to poor housekeeping around the shop. Cluttered aisles and cluttered work areas can be very dangerous to a workman intent on the job he is doing and not alert to obstructions in his path. Improper piling or storage of raw materials can constitute a hazard around the shop.

In this category are included many of the accidents which befall an installation crew for a heating and sheet metal contractor. Working in either new or old houses, unfamiliarity with surroundings and lack of proper lighting may lead to serious accidents.

Reducing injuries of this type means closer attention to housekeeping in the shop and increased precautions on the job. In the shop there should be adequate storage bins for raw material, finished stock, and scrap. Everything should be kept off the floor that does not belong there and the aisles should be kept clear and well marked.

The next type of accident results in high dollar expense and is one of the principal problems of the contractor who does roofing. Falls cause more serious injuries than almost any other accidents and in this industry are usually due to three causes:

- 1) Defective ladders
- 2) Insecure placing of ladders—improper use
- 3) Work on sloping roofs or insecure scaffolding

Best preventive for the first listed cause of falls is the purchase of sound, well made ladder equipment suited to the job for which it is intended. Regular inspections should be made of all ladders to check on their safe condition and they should not be painted with opaque paint to conceal any possible flaws which might develop. Use of safety feet is recommended for ladders, the particular type of feet depending on the use of the ladder. Some falls are a result of trying to work without moving the ladder frequently enough. Workmen should be cautioned never to overreach themselves.

Hazards present in working on a sloping roof can be reduced by use of roof cleats and roof ladders. Where scaffolding is used it should also be checked regularly to assure its safe condition. On some roofs safety lines and belts may be required and these devices require periodic checking, too.

Use of Machinery

Next is a type of accident most familiar to the sheet metal shop operator. Accidents involving the use of machinery are frequently due to lack of proper protection at the point of operation, but, sometimes the worker removes or fails to use the guard provided.

While serious injuries have been sustained on other pieces of equipment in the shop, probably the most dangerous machine is the squaring shears. All belts, pulleys, gears and motor couplings on all types of equipment should be fitted with safety guards. In addition to this fundamental precaution it is likely that sooner or later the cutting blade of a squaring shears that is operated without a blade guard will harm an unwary operator. Frequently, these guards are made of wire mesh (see photo) so the operator can observe the cutting action and follow the layout lines. The use of mesh for this type of guard is permissible as long as it is installed so that the man cannot get his fingers under the blade. When helpers work at the rear of a shears guards should be installed on that side also.

Another machine which causes numerous injuries is the slip roll former. One of the illustrations shows a simple guard for this machine which consists merely of two steel rods that are mounted in front of the rolls.

Accidents which befall a worker when he removes the safety guard from a machine make clear the need for strict supervision of machine operation and development of a safety program which will emphasize the importance of all safety guards. The safety program should include maintenance of proper lighting around all machines, plans to keep the floor in good condition and free from all obstacles and the provision of storage racks and scrap boxes to facilitate handling material at the machines. Signs should be posted on each machine indicating its maximum capacity and the materials which can be worked in it.

Falling Objects

Falling objects are the next important source of injuries. Some causes are: carelessness in placing tools on ladders and sloping roofs; failure to keep clear of men working overhead; use of pulleys and hand lines to hoist stock and tools and the dropping of heavy or sharp stock. Most obvious remedy is to make adequate

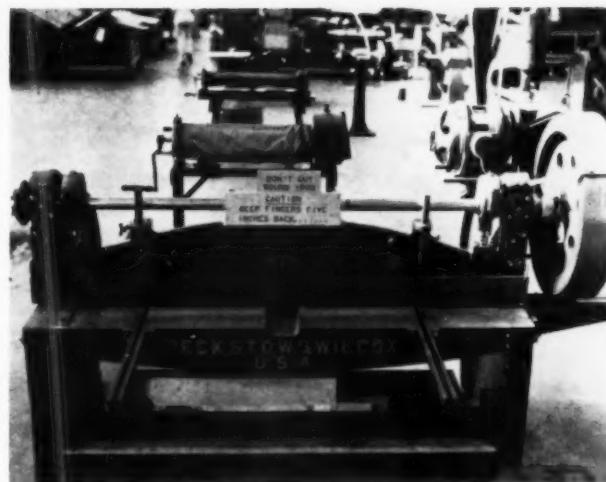


Fig. 6 This shows a solid type guard for a squaring shear which makes it impossible to catch the fingers under the blade.

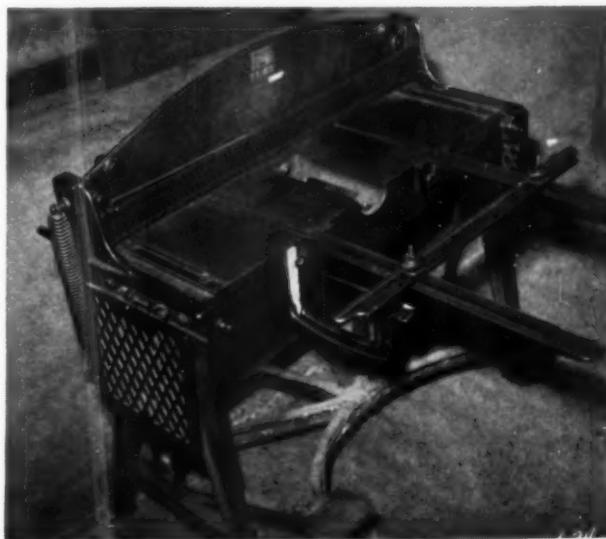


Fig. 7 The guard on this shear is of the wire mesh type so that the operator can see the cutting path of the blade.

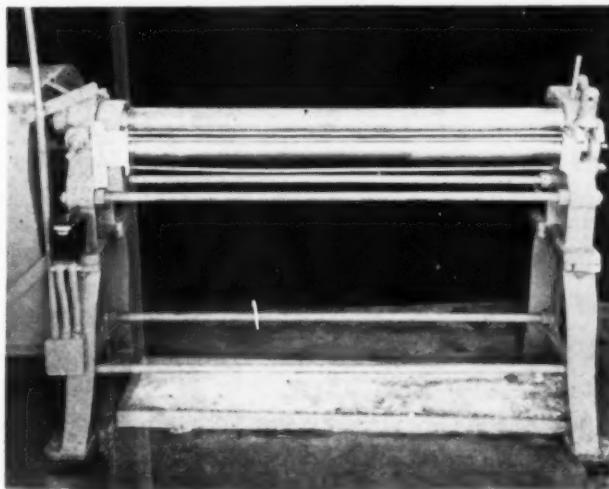


Fig. 8 The steel rods placed in front of the rolls of this slip roll former made it safe.



Fig. 9 A guard for the motor and drive belts of this flexible shaft grinder has prevented accidents.

provision for safe handling of tools wherever the men work. Such provisions may include tool boxes, toe boards on scaffolds or cleats on roofs. Whatever facilities are provided the tools should be safe at all times. Posting warning signs may be necessary where men are working overhead if workers below are not sufficiently conscious of the danger. Where tools are hoisted from one level to another it is essential that ropes and tool bags are in good condition and inspected regularly. To avoid mishaps from dropping materials or tools it is sometimes advisable for men below to wear safety helmets.

Final specific cause of accidents listed is hand tools. The nature of work in the sheet metal industry requires many sharp-edged tools for various operations. After considerable use these tools become worn and defective and a source of danger to the man using them. Primarily, every man using a tool in a shop should either be familiar with its use or instructed on how to use it. It is important to emphasize that all

Large toe	35 weeks
Other toes	12 weeks
Eye	120 weeks
Ear	50 weeks
Both ears	125 weeks
Testicle	50 weeks
Both testicles	150 weeks

Death Benefits

	Minimum	Maximum
4 times annual earnings	3750.00	6000.00
1 child	4500.00	6675.00
2 children	4650.00	7500.00
3 children	4800.00	8000.00
4 children	4800.00	8500.00

worn or defective tools should be reconditioned before they cause any harm. It is far better to delay a job a bit until safe tools can be provided than to cause a workman to suffer an injury that might be permanent and costly.

As an example of employers' liabilities which arise from accidents in the heating or sheet metal industry, we have compiled in Table I the rates of compensation established by the State of Illinois for injury or loss of life. The original Illinois Workmen's Compensation Act became effective May 1, 1912, and has been frequently amended since that date.

Compensation rates shown in the table are the official rates and the variations coincide with varying earnings. Where maximums are listed that is the full, legal amount for which the employer is liable. Function of this act is to protect the interests of injured workmen and as a result when a covered employee is injured he must accept the amount designated by the compensation board. Some states permitted an employee to refuse the compensation award and sue for whatever sum he felt he could obtain. As a general rule, this practice has fallen into disuse and has been replaced by automatic awards.

Compensation awards of the State of Illinois have been steadily increasing over the last decade. The rates shown in the table became effective July 1, 1949 and represent a 50 per cent increase over previous rates. Undoubtedly, compensation awards of other states either have increased or will be proposed and the result will be higher insurance premiums. This, in turn, accents the importance of keeping the accident rate down to make a good experience rating for the industry and thus maintain or lower premiums.

Having discussed the accidents common to the industry and the compensation awards for which contractors are liable, the next logical step is to review the cost of workmen's compensation insurance to provide employer protection. Table II contains the premium rates for the states which allow private insur-

TABLE I
Rates of Compensation

	Minimum	Maximum
No children	50% wages	11.25
1 child	55% wages	16.50
2 children	60% wages	18.00
3 children	65% wages	19.50
4 or more children	65% wages	21.00
		30.00

Thumb	70 weeks
Index finger	40 weeks
Middle finger	35 weeks
Ring finger	25 weeks
Little finger	20 weeks
Hand	170 weeks
Leg	190 weeks
Foot	135 weeks

TABLE II

State	Rate per \$100 of payroll
Arizona	4.53
Arkansas	3.33
Colorado	1.57

Connecticut	3.52
District of Columbia	2.53
Florida	2.11
Georgia	1.38
Idaho	2.19
Illinois	2.39
Indiana	1.91
Iowa	1.98
Kentucky	1.68
Louisiana	3.91
Maine	1.56
Maryland	2.07
Massachusetts	1.86
Michigan	1.45
Minnesota	1.55
Mississippi	3.39
Missouri	2.24
Montana	3.11
Nebraska	2.35
New Hampshire	2.08
New Jersey	2.35
New Mexico	1.60
New York	4.83
North Carolina	1.87
Oklahoma	3.67
Oregon	6.42
Rhode Island	7.43
South Carolina	2.86
South Dakota	1.71
Tennessee	2.06
Texas	2.26
Utah	1.94
Vermont	1.33
Virginia	1.75
Washington	4.59
Wisconsin	2.94

ance companies to operate in this field. The variation in premiums is startling, ranging from a low of \$1.33 per \$100 of payroll in Vermont to a high of \$7.43 per \$100 in Rhode Island. The premiums listed are for the classification which includes erection, installation, and repair of sheet metal, in the shop and out, including drivers, chauffeurs, and helpers. There is no specific classification for warm air heating operations and most shops are insured under the classification described. However, some states recognize the difference in hazard between shop and outside work and permit the work to be split up and the shop work to be covered by another classification which carries a lower premium.

It would be well to see how the premiums are determined. Compensation insurance is generally under the jurisdiction of the state labor department which studies the accident history of an industry and sets the rates for the insurance premiums. In the case of one state, New York, the premiums are set for three years. At the end of this time the accident history of the industry is studied and the rates are adjusted according to experience. The operation is basically quite simple, if there have been fewer and less serious accidents than the rate expected, the premium will be lowered. If accidents have been more frequent than the current standard, the premiums will go up. It is

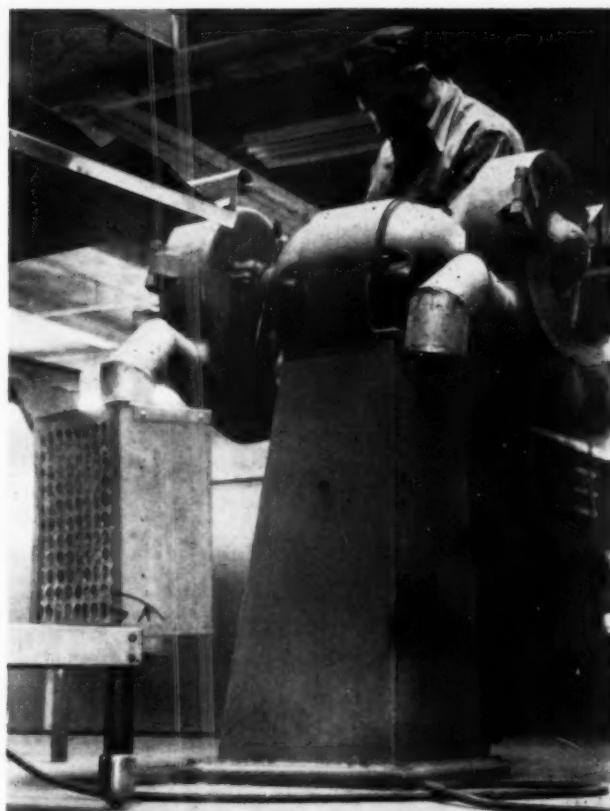


Fig. 10 This dry filter box helps keep dust out of the air in the shop and control flying particles of metal.

quite apparent that if every warm air heating and sheet metal contractor in the industry tries to make his safety record the best possible, the result will be a good rating for the industry and a lowered premium.

To return to a point brought out previously, if the number of accidents is curtailed there will be a considerable saving in the indirect expenses which accompany accidents as well as the saving in insurance premiums.

An overall safety program that is effective and well planned is the means of making the shop a good place to work and cutting expenses through the lowered premiums and expenses just described.

An industrial safety program must originate with the head of the organization.

The owner or manager must convince his employees that he is determined to do everything possible to make the shop a safe and healthy place in which to work.

Appoint a safety director.

Whether the organization is large enough to justify giving the man the actual title is unimportant, the essential thing is to make one reliable man responsible for safety at all times. In order to make the safety program function properly it is vital that the safety director be given complete authority to enforce the rules laid down.

Analyze accident records.

One of the first duties of the safety director should be to study the accident records of the shop to determine what accidents can be prevented by a good safety program. Provision should be made for complete and accurate reports on all future accidents so that causes

(Continued on page 184)

Pattern Development for

Conical Flashing for Pitched Roof

WILLIAM NEUBECKER
Brooklyn, New York

THE drawing on the opposite page shows the simplified triangulation method used in developing the pattern shape. Draw the pitch of the roof, *R-L*, and in its proper relative position draw the elevation of the flashing. Note that the horizontal projections of the sloping sides are similar on both sides. Below the elevation draw the plan using the center *A*. Space the half plan in equal divisions, as shown from 1 to 7. Perpendicular to these divisions intersect the roof line, *R-L*, as indicated by $1^{\circ}-7^{\circ}$. It now becomes necessary to find the true section on the line $1^{\circ}-7^{\circ}$ as follows:

At right angles to *R-L* from the divisions 2° to 6° draw lines indefinitely. Now, measuring from the line $1^{\circ}-7^{\circ}$ in plan, take the various distances to points 2 to 6 and place them on similar numbered lines drawn at right angles to *R-L* in elevation from points 2 to 6. These distances are always measured from the line *R-L* and in this way the intersections marked 2° to 6° are obtained. Trace a line through the points so obtained, then the elliptical outline $1^{\circ}-4^{\circ}-7^{\circ}$ will be the desired semi-section. Above the line *a-g* in elevation, using *d* as center, draw the semi-section on the line *a-g* and divide it in the same number of divisions as in the semi-plan and letter these divisions from *a* to *g*. Connect these divisions in elevation by solid and dotted lines, always drawing the dotted lines the shortest way across. These lines then represent the bases of the true length sections to be constructed, whose altitudes will be equal to similar lettered and numbered heights in the semi-circle and elliptical sections in elevation.

Finding True Lengths of Solid and Dotted Lines

Fig. 1 shows the true lengths of the solid lines. For example: to find the true length of the solid line $6^{\circ}-f^{\circ}$ in elevation, set off this distance in Fig. 1 as shown by $6^{\circ}-f^{\circ}$. At right angles to 6° and f° erect perpendicular lines equal respectively to $6^{\circ}-6^{\circ}$ in the elliptical section and $f^{\circ}-f^{\circ}$ in the semi-circular section in elevation and

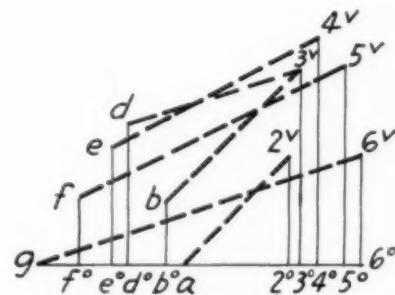
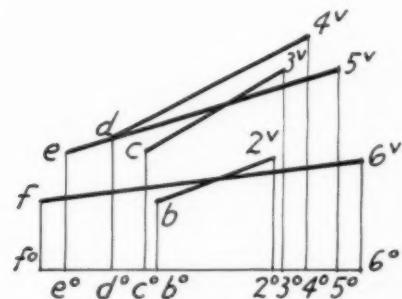
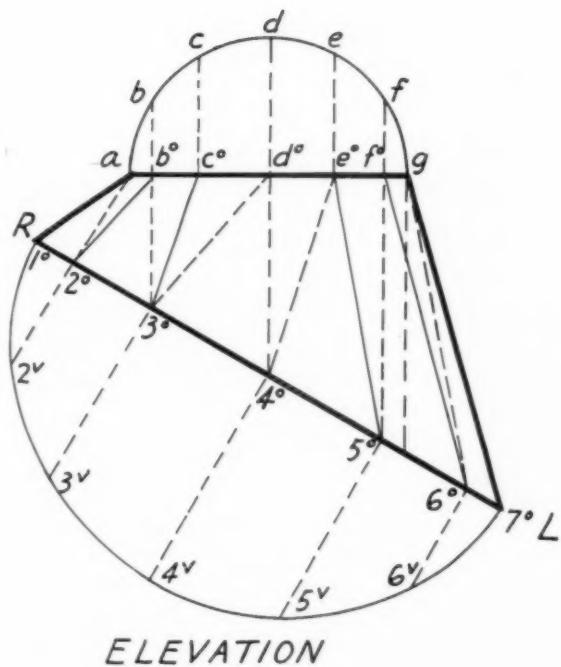
place them in Fig. 1 as shown by $6^{\circ}-6^{\circ}$ and $f^{\circ}-f^{\circ}$. Draw the heavy, solid line from 6° to f° , the desired true length. Proceed in this manner to obtain the balance of true lengths of the dotted lines. In a similar manner obtain the true lengths of the dotted lines shown in Fig. 2. For example: Take the length of the dotted line $6^{\circ}-g$ in elevation and place it in Fig. 2 on the horizontal line $6^{\circ}-g$. From 6° erect the perpendicular line $6^{\circ}-6^{\circ}$ equal to $6^{\circ}-6^{\circ}$ in the elliptical section in elevation. As the point *g* in elevation has no height, draw the heavy dotted line from 6° to *g*. Proceed in this manner for the balance of the dotted true lengths.

Developing the Half Pattern for the Flashing

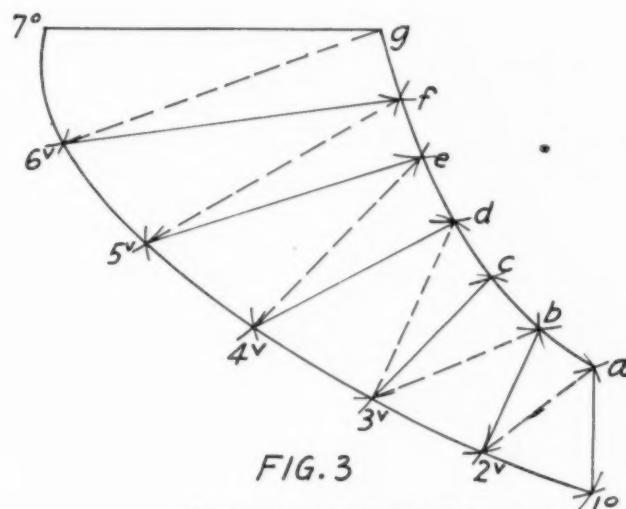
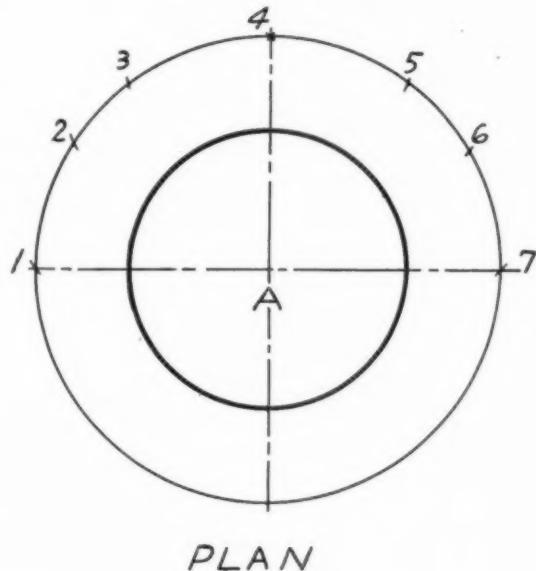
The developed half pattern is also shown in Fig. 3. Take the distance of $7^{\circ}-g$ in elevation, which shows its true length and place it on the horizontal line $7^{\circ}-g$ in Fig. 3. Now with $7^{\circ}-6^{\circ}$ in the elliptical section in elevation as radius and 7° in Fig. 3 as center, draw a short arc near 6° and intersect it by an arc struck from *g* as center with a radius equal to the true length of the dotted line $6^{\circ}-g$ in Fig. 2.

Now, with *g-f* in the semi-circular section in elevation as radius and *g* in the flashing pattern as center, draw a short arc near *f* and intersect it by an arc struck from 6° as center with a radius equal to the solid true length $6^{\circ}-f^{\circ}$ in Fig. 1. Proceed in this manner until the dotted line $2^{\circ}-a$ in Fig. 3 has been drawn. Then, using $2^{\circ}-1^{\circ}$ in the elliptical section in elevation as radius and 2° as center draw a short arc near 1° and intersect it by an arc struck from *a* as center with a radius equal to $1^{\circ}-a$ in elevation. Through points so obtained trace the curved outline. Then *a-g-7-1-a* will be the net half pattern. Note that the numbers and letters in the elevation, semi-elliptical section, semi-circular section, true lengths of solid and dotted lines, all correspond so that the development of the flashing pattern can be easily followed.

Sheet Metal Pattern



TRUE LENGTHS OF SOLID AND DOTTED LINES



HALF PATTERN FOR FLASHING

Conical Flashing for Pitched Roof

— Wm. Neubecker

Cleaning Stainless Steel Equipment

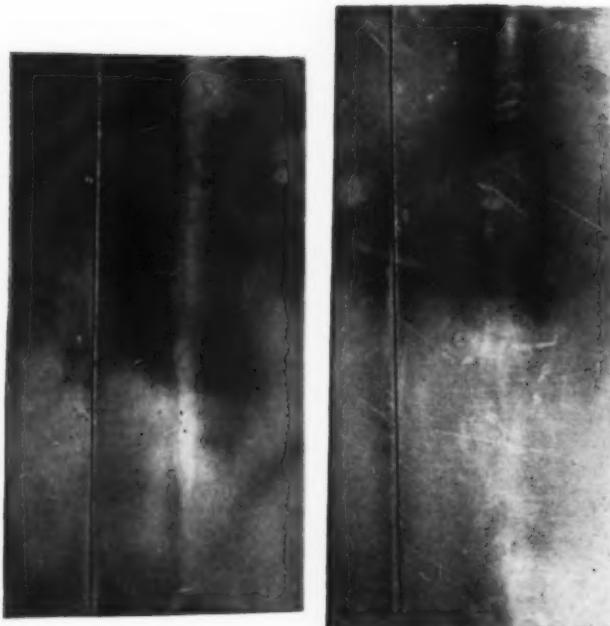


Fig. 1 Heat discoloration has been removed from the lower half of these silver brazed stainless steel samples with a mild abrasive cleanser. The original surface can also be restored with commercial stainless steel cleaners.

STAINLESS steels are at their best when they are kept clean. Accumulations of grease, films, dirt and other ordinary deposits may detract from their appearance although, underneath, the metal remains unharmed. In many applications, such as restaurants, kitchens, food processing plants and retailing stores, sanitary regulations require that equipment be kept clean and sterile.

Cleaning stainless steel is simple, if a few basic rules are followed. The maintenance procedure required can be determined after a few trials with increasingly effective methods. It is good practice not to use the more time consuming methods until simpler ones have proven inadequate.

Ordinary accumulations of dirt, light grease and filmy coatings can be removed with plain soap and water applied with a soft cloth. Other materials for the same type of cleaning include soda ash, borax, sodium perborate and washing soda. Ammonia and water conditioners will make cleaning easier in communities where the water supply is hard.

Scrubbing with a mild cleansing agent will normally dislodge particles of foreign matter not affected by soap and water washing. Whiting, magnesium oxide, grade FFF Italian pumice and fine household and commercial cleansers are excellent for this purpose. They should be applied with a soft cloth, sponge or

RICHARD E. PARET

American Iron and Steel Institute

With the increasing use of stainless steel because of its beauty and durability the problem of cleaning stainless steel equipment and preserving its finish has become a major one. Here are some authoritative tips on how to do it.

brush. Some of the coarser abrasive agents may scratch highly polished surfaces and so should be used carefully.

Use of harder materials on stainless steel should be avoided if possible. Wire brushes, files, scrapers and other tools will scratch or gouge the surface and make refinishing necessary. In many cases where it is necessary to remove extremely obstinate deposits, stainless steel wool can be used. Even then care must be exercised. Scratches tend to accelerate the growth of deposits and each successive cleaning becomes more difficult.

In any case, never use a metallic cleaning tool other than stainless steel. Particles of the foreign metal may become imbedded in the surface and rust or discolor, although the stainless itself does not rust. Local stains of this type may ruin the appearance of an installation.

Many joints on stainless steel are made by soldering.



Fig. 2 The bright finish of stainless steel is restored by cleaning this soldered joint with a mild abrasive cleaner.

Fig. 3 Proper cleaning of the soldered joints of this portable stainless steel ice box will prevent staining by the soldering flux. It will be thoroughly rinsed after cleaning.

In all cases a flux is used to prepare the surface for a strong seam. The flux must necessarily be of a material which will attack stainless steel. Therefore, it is highly important that all traces of the flux be removed immediately after soldering to prevent further attack on the metal.

Cleaning of flux materials can be done with a strong soap, a 5 to 10 per cent solution of washing soda or an ammonia water solution. A thorough water rinse should follow the cleaning process.

Occasionally during soldering, and often during welding the heat generated is sufficient to cause surface discoloration of stainless steel. This tint is due to the thickening of the chromium oxide film which protects the steel from rusting. The original finish can be



Fig. 4 Dirt and grease are removed easily from stainless steel with soap and water, soda, borax, and other cleaners.

Fig. 5 Mild household cleansers can be used on those spots not removed with soap and water. Coarse cleansers may scratch the polished surface of stainless steel.

restored easily by applying a commercial stainless steel polish or a mild abrasive cleanser with a soft cloth. NuSteel, applied with stainless steel wool, will also do the job.

Heavy, hard deposits should not be allowed to remain on stainless steel surfaces for long periods of time. While they normally will not attack the metal directly, it is possible that an electrolytic cell will form between the accumulation and the stainless steel. In time, the action of the cell may be sufficient to cause severe localized pitting.

With proper care, stainless steel equipment has a long and useful life. Perhaps the best rule of all is, "don't let it go until tomorrow."



Complex Surfaces Can Be Insulated Here's How It Is Done

In some industrial processes application of insulation is essential to prevent waste of fuel and reduced efficiency. Here is an instance of insulating heater and blower units which required ingenuity.

IT'S comparatively easy to insulate oven structures and ducting, their sides are flat. Even where ducts are cylindrical, flat insulation can easily be wrapped around the curved surfaces. But the insulation of odd-shaped heater units and recirculating blowers is quite another matter. Rotating shafts, burner flange assemblies, and odd-angle duct connections, make the geometry of these units quite complex and hence make them difficult to insulate.

However, the exposed areas of heater units and recirculating blowers are sufficient to represent considerable heat losses, and wasted fuel, if these parts are permitted to remain uninsulated.

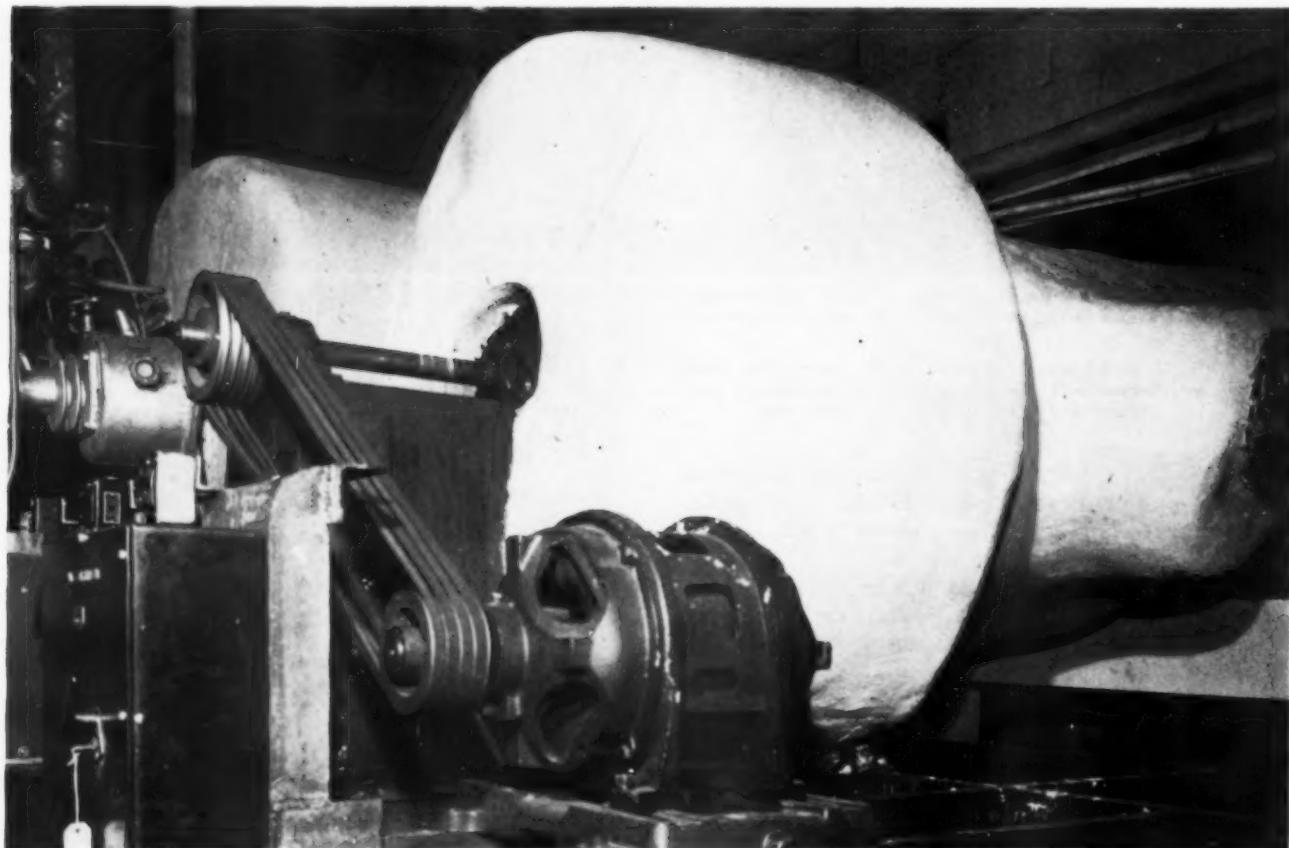
How this problem was solved by a large eastern manufacturer of dishwashing machines may help others facing similar problems. In this case white

finishes are baked on home appliances by means of a 100 ft traveling oven maintained at a temperature of 300 F.

Three large gas fired heater units, coupled with three 13,000 cfm blowers driven by 10 hp motors, perform the functions of heating and recirculation at three points along the oven length. Since the oven is elevated some 10 ft above the plant floor and is fed with hot gases from the top, these heater-blower units are installed upon a special platform alongside the oven, 17½ ft above floor level. The photographs show two views of one such unit and the catwalk for heater and blower servicing. Note the thoroughness of the insulation despite the convolutions of surface and the confined working room.

Basic insulating material was 4 in. thick mineral wool blanket, sandwiched between 1 in. chicken-wire

Fig. 1 This clearly shows how the insulation followed the contours of the heater and blower.



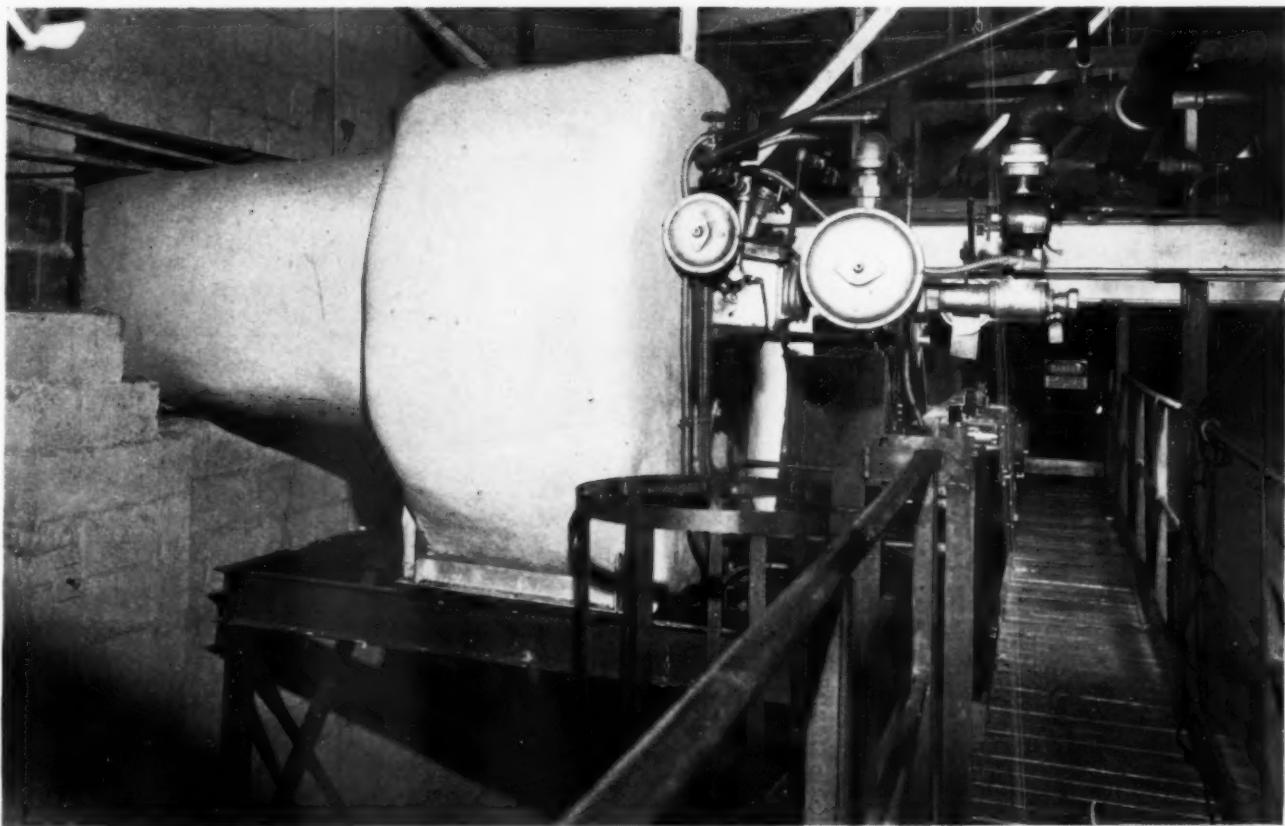


Fig. 2 The catwalk alongside the heater is 17½ ft above floor level and facilitates any service which might be needed.

mesh on one side and expanded metal lath on the other, and supplied by the manufacturer in 2 by 8 ft pieces. This material was selected for its high insulating efficiency, its non-settling quality under the constant vibration of blower and heater operation, and its ability to be cut easily and shaped to almost any contour. Some 1132 sq ft of surface were insulated and the job was done in less than 32 hours, including application of finishing cement.

First, holes were drilled in the sheet metal exteriors of blowers, heaters and ductwork. These holes were fitted with self-tapping screws which were used to affix long double tails of No. 16 galvanized wire to the sides of the various pieces of equipment. Mineral wool blankets were then laid temporarily over the surfaces and drawn down so that marks could be made to indicate the geometry of the cutting of the chicken wire and metal lath for purposes of shaping the mineral wool blanket in two directions. After marking, the blankets were spread out on the floor and the chicken wire snipped first. The blanket was then turned over and the metal lath cut away. Finally the blanket itself was cut. The cutting was always done so that an overlap of both chicken wire and metal lath connected cut-blanket segments. None of the metal lath scraps were thrown away for they were later used in lacing exposed patches and areas of mineral wool, so that the finished job had a complete envelope of metal lath for good adhesion of the finishing cements.

Every single blanket used on the job had to be cut and fitted in some way in order to custom-fit the odd shaped equipment. Their ability to lend themselves to

such fitting was one reason mineral wool blankets were chosen for the job.

As the sections were installed after cutting, the galvanized tie wires were pushed through the blankets and the ends twisted together to hold them in place.

Loose scraps of mineral wool were used to fill in pie-shaped voids in the job, and scrap metal lath laced with galvanized wire was used to hold the patches in place. All corner joints of metal lath were laced as well as edge lapped.

Finishing Procedure

The end result was a continuous 4 in. layer of mineral wool securely retained within an intricate metal lath cage and held to the heater, blower, and ducts by wire ties. Thus, perfect resistance to movement of the insulation under the persistent vibrations of blower and heater operation was achieved. The close knit fibrous structure of the mineral wool was insurance against any possibility of settling of the insulation.

Over the metal lath cage containing the blanket insulation was troweled a $\frac{1}{2}$ to $\frac{3}{4}$ in. layer of mineral wool insulating cement. After drying, this was topped with two heavy troweled coats of finishing cement to result in the smooth, hard finish apparent in the photographs.

While the areas of the heaters, recirculating blowers, and connecting ducts represent only about one-third of the total heat radiating surface, the application of insulation is estimated to have reduced the overall heat loss by one-half since the insulation covered the areas of highest temperatures and greatest gas-scrubbing action.



Marine Sheet Metal Business Plentiful

R. C. NASON
Great Neck, Long Island

Sheet metal contractors located in seaport cities find that ships lying in harbor for repairs provide a ready source of sheet metal work. Repair and installation of sheet metal equipment aboard ship is not only interesting but is quick and profitable as well.

SHIPS docking in New York harbor are an important source of sheet metal work. One sheet metal contractor who has specialized in shipboard repair and installation is Marine Works, Inc. This firm has developed several sheet metal specialties, which include cooking ranges and heavy gauge ventilators. Because ship's galleys vary in size and arrangement, it is impossible to produce a standard range which will fit all requirements; each range must be practically a custom made job.

Speed Is Vital

An important factor in this business is the ever-present need for haste. The ships come into the harbor and are scheduled to depart just as rapidly as possible. Thus, when it is necessary to make repairs or new installations on a ship, the contractor must often assign extra men to get the job finished in time. A complete stock of range parts is carried to assure completion of any installation without delay.

The most popular type of range made by this firm has casing and firebox linings of 14 gauge steel and

oven linings of 16 gauge. Insulation is applied between the two metal surfaces; asbestos slab for ovens, firebrick for fireboxes. Lining panels are riveted together with lapped joints while casing panels are butt-welded.

Range tops are made of 3/16 in. steel plate in panels 2 by 2 ft with dovetailing edges to make them fit together and lie flat when installed. The tops over the firebox sections are butt-welded in position and provided with round openings to receive the usual lids.

Front doors, hinged at the bottom, permit ready access to ovens and firebox. The usual hardware is included with the range. All weld beads are ground flush and, typical of marine ranges, 1½ by 3/16 in. sea rails are provided for the top. They fit into slots in cast corner pieces and keep pots and pans on the range in heavy seas.

Deck Ventilators

The company has also developed a complete line of custom made deck ventilators that is more comprehensive than the usual line. Materials used are carbon steel, galvanized steel and stainless steel and two patterns are produced, the American and Liverpool. The

former pattern is more common on ocean liners and has a large flared opening which is at 90 deg to the neck that joins a duct at the deck line. This type of ventilator can be used for intake or exhaust but the Liverpool model can only be used as an exhaust.

Ventilator Production

Fabrication routine on the two models differs because of the difference in design. In making the American type ventilator, the units with neck openings larger than 28 in. are produced of 14 gauge steel and the smaller ones of 16 gauge steel. The smaller sizes are made by joining full transverse sections, that resemble smoke pipe elbows, but the larger units are made in 12 separate sections and then welded together with butt joints. The result is a central vertical joint down the outer radius. Parts for these large ventilators are produced on forming blocks with heavy hammers. This method has been used for many years and the men have developed such skill that parts are

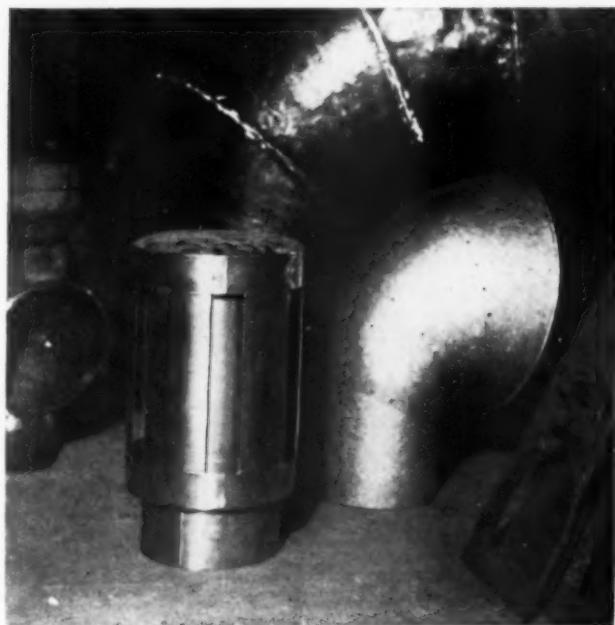


Fig. 1 In the foreground is a Liverpool ventilator while the units behind it are the American type, of various sizes.

cut from flat patterns and then contoured by eye. Seldom is it necessary to bring a part back to the forming block.

An interesting technique is used to stiffen the edge of the flaring mouth of this type of ventilator. Since it is difficult to roll 14 gauge steel, the procedure is to take 3/4 and 1/2 in. steel pipe, bend it to the required shape and cut a continuous slot in it so that it can be slipped over the edge of the vent. The pipe is then welded into position and any gaps are filled in.

Vents Must Revolve

Finishing of the neck edges of the ventilators is done according to the deck conditions. If there is a collar or riding ring available the contractor does not have to furnish one. This ring is necessary to make it possible to turn the vents to change their operation from intake to exhaust. Handles are welded on the vents and a manual damper is provided at the base

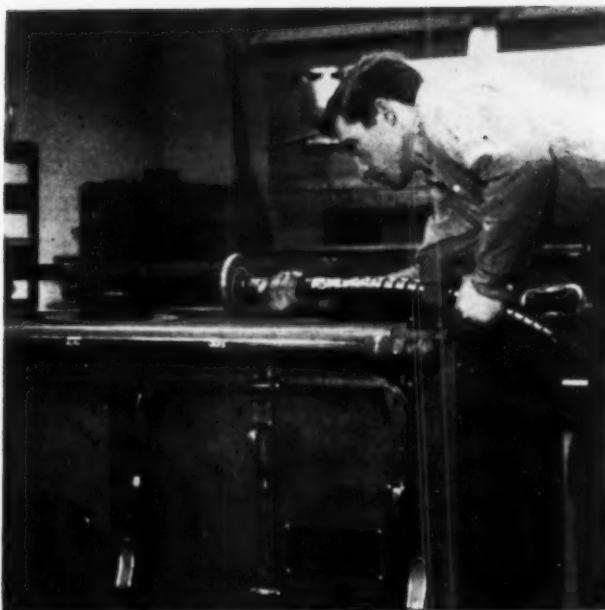


Fig. 2 This operation is grinding the weld beads on the top of a galley range. Sections over the firebox are butt-welded.

to close the opening in case of foul weather.

Liverpool ventilators have been used on land as well as in marine work and their general design is probably familiar to most sheet metal men. As shown in one of the pictures, this ventilator is of vertical design with slots around the periphery. Most frequently produced of carbon or galvanized steel, many have also been made from stainless steel for luxury yachts. These ventilators are of welded construction with the welds ground and polished.

Among the smaller items made by this contractor are cooking utensils of various types and designs. It is an oddity that the ships from different nations that enter the port seem to prefer varying designs of the same basic utensil. It has thus been necessary for

Fig. 3 Repairs were made on this coffee urn as repairs are made on many galley utensils by Marine Works.





Fig. 4 Mechanic is beading the side of one section of the coffee taster's cuspidor, made in this shop.

some of the mechanics to become familiar with foreign designs as well as domestic. Some of the journeymen have been working at Marine Works for over 20 years.

Because of variations in design, it is not possible to set up any kind of volume production on small utensils. Every order of this kind requires a large amount of hand work. However, hundreds of patterns are held in file and few orders received now require any pattern work.

Use of Stainless Steel

Stainless steel is growing in popularity for marine applications. This firm had provided two complete stainless steel galleys for the Normandie when that ship was being refitted before it sank. A stainless steel galley was supplied for a war surplus craft recently converted into a pleasure yacht and many orders like this have been executed. The Navy and Coast Guard have been frequent customers of Marine Works. Ventilating equipment is often sold as well as galley furnishings. Bilge pumps have been made to the number of many thousand by this contractor.

One of the most unusual orders received recently called for several two section cupids made of 24 gauge brass. Used by coffee tasters, these cupids are 24 in. high and 14 in. in diameter at the top and base but taper to 4 in. at the center. The hourglass shape that results can be seen in the photo. The lower basin, which is mounted on casters, has a capacity of 5 qt. The tasters never swallow the sips of coffee that they taste so the cupids are always busy.

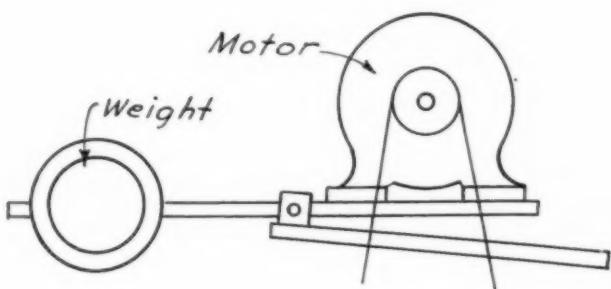
The lower section is fitted with handles to facilitate emptying and the 4 in. neck allows swabbing out as needed. The sides of the cupids are beaded to add stiffness and provide ornamentation.

Vertical Drives With Pivoted Motors

THE STATEMENT IS OFTEN MADE that "Pivoted motors are not practical on vertical drives when the motor is on top." Such a statement may be true sometimes, but not always. This writer knows of instances where vertical drives of this kind, with the motor on top, have been hinged as indicated in the accompanying sketch. The drives, furthermore, are giving satisfaction.

The weight need not necessarily be greater than the weight of the motor. If desired, the motor can be placed partially over the pivot. It is obvious that, even as sketched, with the motor so far removed from the pivot, this drive can be made to function. Simply add a lever arm that is long enough, and a weight heavy enough, and the motor will be lifted against the load, maintaining sufficient tension in the belt at all times. The greater the distance of the motor's center of gravity from the pivot, the greater the weight required. But there is an advantage in the greater distance, namely, the belt need be shortened less frequently because of the greater vertical motion of the motor on its longer lever arm.

Drives of this type may be purchased as a unit. If you are not well equipped with tools it may be better to buy a ready made drive of this kind than to attempt



making one yourself. What the writer has in mind principally is to show how this can be done. There are too many who still believe that it is not possible.

W. F. SCHAPHORST
Newark, New Jersey

COPPER AND COMMON SENSE



Architect: Jens Fredrick Larson, New York; Contractor: O. A. Petersen Construction Co., Montclair, N. J.; Sheet Metal Contractor: Moeltner Company, Montclair, N. J.

ANOTHER LASTING ROOF OF REVERE COPPER

A NEW dormitory is now being completed at Upsala College, East Orange, N. J. Among the quality features that will preserve this handsome building for generations of future students are a batten seam roof and box gutter utilizing more than 13,000 pounds of Revere copper sheet and copper strip.

Revere copper for roofs, flashings and gutter linings is the common sense choice whenever you want extra years of service. Not only is copper the most enduring of all the commonly used sheet metals when exposed to the elements, but the Revere Research Laboratories have developed design and installation data that help you provide the very finest sheet copper construction.

Whenever you are faced with a problem concerning the design or installation of copper, look first to the Revere sheet copper manual entitled "Copper and Common Sense"; and if you do not find the complete answer there, the Revere Technical Advisory Service,

Architectural, will be glad to help you. The chances are that they have already had experience with a similar problem. In any case, they'll do their best to help solve yours.

There is no charge or other obligation for this service. Simply call your Revere Distributor or the Revere Office nearest to you.

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When shipments fall off—where there are unused shop facilities—two solutions present themselves: (1) to increase sales volume by expanding into a new market with new products—(2) **manufacture more of your present products in your own shop.**

How seriously have you considered building your own Blower Assemblies? Return to competitive selling now makes your own building of your own Blower Assemblies doubly advantageous. You use your own equipment, your own facilities and your own personnel. This helps to carry overhead. It cuts down purchase of finished units produced outside your plant. You buy for your own Blower Assemblies only Morrison wheels, and bearings, and drives.

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- (1) Morrison Airstream Blower Wheels;
- (2) complete blower engineering service;
- (3) shop drawings; and
- (4) templates.

Detailed facts are available on request.



MORRISON PRODUCTS, INC.

16812 WATERLOO ROAD • CLEVELAND 10, OHIO



Detroit

Because of the recent approval of 12,000 additional gas heating units in Michigan, the Detroit Association of Warm Air Heating and Air Conditioning Contractors, Inc., feels that this a most opportune time for members to put on intensive advertising campaign. The volume of business which will result from this allocation will have a tendency to attract all sorts of retail stores to the sale of heating equipment. For this reason, the association bulletin stresses the need for advertising and authorizes every member to use the association name in his advertising, so that the public will be certain that they are doing business with legitimate heating contractors.

Also available to members in the recent bulletin is a schedule of tax provisions as they stand under the amended Michigan sales tax law.

New York

The July issue of Institute Ticker, monthly bulletin of the Roofing and Sheet Metal Crafts Institute, New York, reports the following changes in the New York Workmen's Compensation Law, which were enacted during recent sessions of the state legislature.

Senate Bill 609, effective July 1, 1949, increases the maximum amount payable for temporary partial disability from \$4,000 to \$5,500, and for temporary total disability from \$5,000 to \$6,500.

House Bill 709, also effective on July 1, 1949, increases the allowance for funeral expenses from \$200 to \$400.

The Ticker article states that a resultant increase in Workmen's Compensation insurance rates is expected.

Indiana

The Terre Haute District Meeting of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Inc., brought out a record-breaking attendance of contractors and supply house representatives, according to a recent report by Frank E. Anderson, secretary of the association.

The evening meeting was held in the Deming Hotel, with President William E. Garber acting as master of ceremonies. Mr. Garber called the meeting to order and introduced James G. Beard, manager of the Braden Manufacturing Company, Terre Haute, who welcomed the guests. After commending the Indiana association on their activities, he introduced the president of the Terre Haute local association, William C. Balfe, who extended greetings from his association.

Featured speaker was Ralph Clifford, president of Continental Steel Corporation, Kokomo, Ind. Mr. Clifford presented an informative talk, describing the

properties and composition of various metals, their treatment, and adaptability to use in construction and metal fabricating industries. Concluding his address with an analysis of business problems, the speaker offered some valuable advice on adjustments required by present conditions, all of which was most interesting to the contractors and salesmen present.

L. D. O'Donnell, first vice president of the state association, discussed future goals of the association, and Secretary Anderson expressed the association's appreciation to the Braden Manufacturing Company and its manager, Mr. Beard, for their cooperation in acting as hosts for the meeting.

The secretary then welcomed two new sponsors—Baker Specialties and Supply Company, Logansport, Ind., and The Richmond Supply Corporation, Richmond, Ind.

Coming Events

Sept. 25-Oct. 2—Houston Chapter, Associated General Contractors, 2nd Annual Houston Construction Industries Exposition. Sam Houston Coliseum, Houston, Texas. Loy W. Duddleston, General Manager, Exposition Policy Committee, 2103 Crawford St., Houston 3, Texas.

Oct. 17-20—American Gas Association, Annual Convention. Palmer House, Chicago, Ill. Kurwin R. Boyes, Convention Manager, 420 Lexington Ave., New York 17, N. Y.

Nov. 14-18—Refrigeration Equipment Manufacturers Association, 6th All-Industry Refrigeration and Air Conditioning Exposition. Atlantic City Auditorium, Atlantic City, N. J. George E. Mills, Show Director, All-Industry Exposition, 1346 Connecticut Ave., N.W., Washington 6, D.C.

Jan. 23-27, 1950—American Society of Heating and Ventilating Engineers, Southwest Air Conditioning Exposition of the International Heating and Ventilating Exposition. State Fair Grounds, Dallas, Texas. E. K. Stevens, Associate Exposition Manager, Grand Central Palace, New York City.

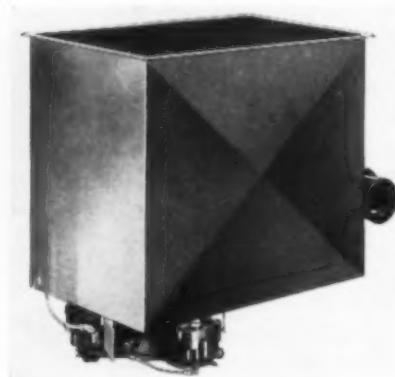
Feb. 2-3, 1950—Sheet Metal and Warm Air Heating Contractors Association of Indiana, Inc., Annual Convention. Hotel Severin, Indianapolis, Ind. Frank E. Anderson, Secretary, 439 So. 17th St., Terre Haute, Ind.

Apr. 11-13, 1950—New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association, Inc., Annual Convention. Hotel Syracuse, Syracuse, N. Y. Clarence J. Meyer, Secretary, 567 Genesee St., Buffalo 4, N. Y.

EQUIPMENT DEVELOPMENTS

Floor Furnace 167

Oil fired floor furnace for small structures is built in three models: with mechanical draft blower to supply the combustion air to the burner and thermostat for controlling the fire; natural draft burner with manual control; or with natural draft burner with electric thermostat. Capacities are 58,500 Btu maximum output for the mechanical draft unit; 51,300 Btu for natural draft.



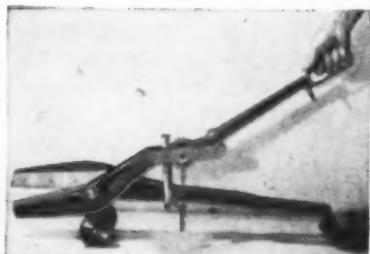
Heavy gauge aluminized steel is used in combustion drum and heat exchanger of the units.

Thermo-Products, Inc., North Judson, Ind.

Heavy Duty Shear 168

New shear for heavy duty sheet metal cutting is offered under the trade name of Super-Shear. It will cut steel sheets, rod and bar stock up to $\frac{1}{8}$ in. thick and even thicker sections of non-ferrous metals. Tool employs a combination of compound lever, rack, and gear to multiply the force exerted on operating handles.

In cutting larger sheets up to $\frac{1}{8}$ in. thickness, shear is placed on the



Use Coupon on Facing Page

floor, supported by rollers attached to lower jaw and held in position by a foot pedal. One or both hands may then be applied to the operating handle. Rack and gear may be disengaged, permitting the shear to be used as a straight hand shear. Lower handle may be placed in a vise for semi-permanent use as bench shear.

Overall length of shear is 36 in.; length of blade, 9 in.; weight, 27 lbs. Illustrated circular is available.

Super Manufacturing Corp., Chicago 24, Ill.

Gas Fired Conditioner 169

Blower type, gas-fired, automatic winter air conditioner is rated at 60,000 Btu input capacity. It is intended primarily for heating small homes, with or without basement. Its compact cabinet measures 52 in. high by 18 by 30 in. Placement of the vent at top, front, permits installation in minimum space.

Factory assembled and tested, the furnace is especially designed for economical installation, servicing, and operation.

Catalog sheets are available.

Henderson Furnace and Mfg. Co., Sebastopol, Calif.

Air Diffuser 170

Square air diffuser that aspirates and distributes air equally over full arc of 360 deg harmonizes with rectangular and straight line architectural designs. Flush with ceiling, it fits readily into standard size acoustical and egg-crate ceilings. Available in 9 different neck diameters ranging from 4 to 14 in.

Diffuser provides 35 per cent aspiration by means of its design. Room air, equal to more than $\frac{1}{3}$ the volume of supply air, is drawn

into the diffuser where it is mixed with supply air before passing slowly into the room in a series of multiple planes. This effect assures complete air distribution throughout the entire room without drafts or stale air pockets.



Type E diffuser is easily installed. Snap-on method permits instant removal or insertion of complete inner assembly together with equalizing deflector.

Anemostat Corp. of America, 10 E. 39th St., New York.

Humidifier 171

Series 600 humidifiers are now available in a new finish of attractive and durable gray Hammerloid, replacing the black crackle finish previously used.



By means of rapid evaporating patented Vapoglas plates, the humidifiers will maintain satisfactory humidity with low bonnet temperatures, handling any size warm air heater up to 180,000 Btu. Adjustment is made by varying the number of Vapoglas plates from 5 to 20.

Skuttle Mfg. Co., 4099 Beaufait, Detroit 7, Mich.

Midget Press 172

Small punch press, called the Midget, performs all conventional operations such as punching, shearing, staking, riveting, forming, and coining. It has a standard maximum stroke of $\frac{3}{4}$ in. with $\frac{3}{4}$ in. hole in the ram. Shorter strokes are available on special order. Approximate speed with 1,725 rpm motor is 290 strokes per minute; a $\frac{1}{4}$ hp motor is recommended.

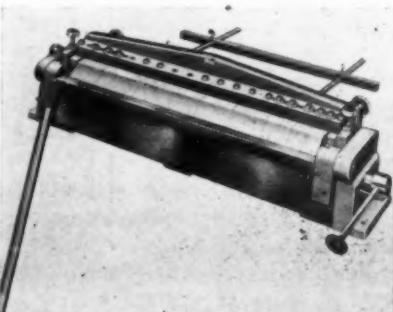


Construction features include alloy steel crankshaft, $\frac{3}{4}$ in. O.D.; sliding key clutch; and 20 lb flywheel measuring 9 in. diameter. Overall height is approximately 17 $\frac{1}{2}$ in.; complete weight, less motor, 65 lbs. Overall bolster plate dimensions are 4 x 6 x $\frac{5}{8}$ in. with a 1 $\frac{3}{4}$ in. hole in center.

Benchmaster Mfg. Co., 2952 W. Pico Blvd., Los Angeles, Calif.

24 in. Box-Pan Brake 173

Ruggedly built 24 in. box and pan brake bends sheet steel up to 16 ga and up to 24 in. wide, to almost any angle, with hairline precision. It is said to handle many types of industrial metal forming, production operations, and experimental shop work as accurately as heavy equipment, yet with substantial savings in cost. Among typical operations



for which the brake is recommended are folding boxes, and finishing metal edges for straight seams and hems of many types.

The bending leaf is operated with maximum ease on needle bearings, and the full 2 $\frac{1}{2}$ in. box or pan permits deeper bends. By simply turning a knob, the positive, cam-actuated angle stop provides adjustment to any desired angle from 0 to 135 deg.

Full description and price information are available on request.

Berkroy Products, Inc., 2516 N. Ontario St., Burbank, Calif.

Register Hood 174

Adjustable hood for wall registers is designed to prevent surrounding wall surface from becoming streaked with soot and smoke. The hood, made of 22 ga metal and finished in bronze hammertone, projects only 4 $\frac{1}{2}$ in. from the wall.

Available in three sizes, the hood is made in two sections: two 7 in. sections for registers up to 20 in.; two 10 in. sections for registers up



to 26 in.; and two 13 in. sections for registers up to 33 in. The joint is covered by a mirror finished butt strap which adds beauty as well as economy.

Wilhelmsen Sheet Metal Works, 4459 Tweedy Blvd., Southgate, Calif.

Counterflow AC Unit 175

Counterflow utility air conditioning unit is especially designed for installation in ranch type homes and basementless houses that are built on a concrete slab. It will operate efficiently on either oil or gas and is approved for either installation.

When the unit is placed over a pit or disbursing chamber in the floor, heat passes through bottom of unit into the pit and then into ductwork imbedded in the concrete. Or, the unit may be placed over a plenum chamber when ductwork is run in the crawl space.

Unit requires small installation space; produces 75,000 Btu at discharge-outlet when oil fired, and 76,000 Btu when gas fired.

C. A. Olsen Mfg. Co., Elyria, Ohio.

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We will ask the manufacturers to send full particulars about the products and literature mentioned. 9-49

Be sure to circle the items you want.

Equipment Developments

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311	312	313	314					

Manufacturer Jobber Dealer

Name

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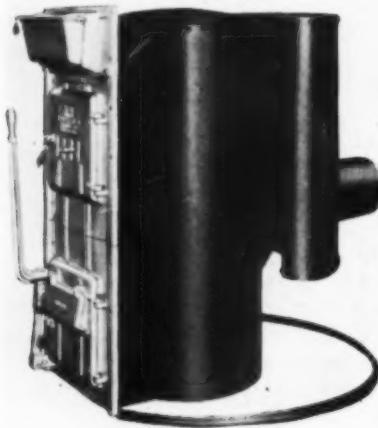
Address: AMERICAN ARTISAN, 6 North Michigan Ave., Chicago 2, Illinois

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 109

Gravity Furnace 176

Gravity warm air furnace, coal fired, is available in four sizes, all with round casings. Gas or dust leakage is prevented for the life of the furnace by the drum which is both welded and riveted. The large surface radiator at the rear is also welded and riveted with the smoke pipe outlet near the bottom. This retards passage of smoke and hot flue gases, and results in greater heating efficiency.



Four sizes of the furnace range from 62,300 to 107,500 Btu. Further particulars are available on request.

Excelsior Steel Furnace Co., 118 S. Clinton St., Chicago 6, Ill.

Powerpile Control System 177

Self-contained automatic heating control system for gas-fired heating plants generates its own electricity to operate a thermostat and automatic gas valve. Thus it may be used in rural areas where electric current is not available, and will provide constant heating despite power failure in urban areas. The device is called the Y200 Powerpile control system. The Powerpile is composed of 25 thermocouples and generates 400 to 500 millivolts, although the system will operate safely on an output as low as 200 millivolts.

The system consisting of three units may be easily installed because no wiring connections with



power lines are necessary. The heat leveling thermostat contains a heat anticipator which uses electrical energy supplied directly by the Powerpile. The diaphragm valve employs a self-contained polarized relay for added power to open and close the gas flow to the burner. It may be used with all types of gas including high sulphur and LP.

The Powerpile itself, encased in stainless steel, also contains a pilot burner. The instrument acts as its own safety pilot in case of flame failure and will shut down the entire heating plant automatically.

Minneapolis-Honeywell Regulator Co., Minneapolis 8, Minn.

Suspended Furnace 178

Master Kraft suspended "package of heat" is an unusually versatile winter air conditioning unit. It is shipped as a vertical floor model but may be easily transformed into

a suspended unit. In addition to its usefulness for heating small homes, this unit has many applications in the commercial line.

The furnace contains two motors, and has a full pressure atomizing burner, actually built into the unit. The burner combustion head is on the extreme right end; the transformer is built on the head.



The complete package, except for fuel tank, is assembled and tested at the factory. Complete details are available in folder No. 4925.

Harvey-Whipple, Inc., Springfield, Mass.

Roof Ventilator 180

Roof ventilator of round stationary type is designed for general ventilation and miscellaneous "hot spots" of industrial and commercial buildings. Known as the Valvent, it is made in five throat sizes—12, 18, 24, 30, and 36 in.

Unique feature is combination
(Please turn to page 112)

Packaged Incinerator 179

New basement incinerator is a packaged unit which can be sold knocked down for home assembly

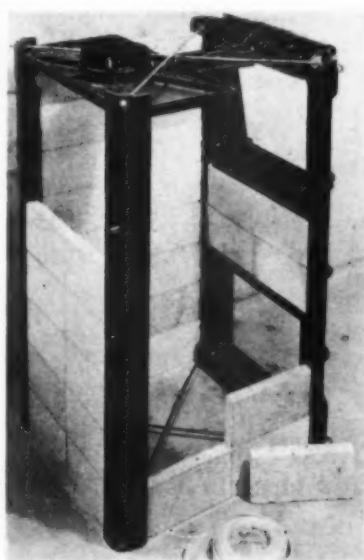
and installation. It is claimed that assembly of the little Cinerator requires no professional masonry or mechanical skill. Unit is illustrated below in the process of assembly.

The incinerator is designed to reduce to ashes, by complete combustion, all ordinary waste, garbage, and rubbish. No additional fuel is required; the refuse acts as its own fuel. Jets of air enter at the four corners of the unit and supply oxygen for both primary and secondary combustion. Fire brick chamber insures retention of heat.

There are no grates or other parts to replace, thus maintenance costs are eliminated. The outer jacket of asbestos board is weather- as well as fireproof. Metal parts are of heavy cast iron.

Folder with complete assembly and installation instructions is available.

The Clear Manufacturing Co., 4525 N. 124th St., Butler, Wis.



Rising Interest In Convertible Heating Equipment Reflected In New Homes Market

E. J. LATTNER, President
Century Engineering Corporation
Cedar Rapids, Iowa

Convertible heating equipment, adaptable for either oil or gas firing, appears to have captured the lively interest of an important number of contractors and builders of small and medium size homes.

Heating dealers report an increasing volume of sales in the new home market to builders who are installing convertible equipment as an added feature which aids them materially in offsetting increased customer resistance to the continued high cost of new homes. A review of the advantages of convertible equipment reveals a number of reasons why builders, as well as dealers and home-owners, regard it with such favor. Convertible equipment, as its name implies, can be easily and economically converted to oil or gas heating as conditions demand. This has particular appeal to those who prefer gas heat and plan to buy or build in an area where gas is not yet available. They can install an oil-fired unit and enjoy fully automatic heat "while they wait".

This same feature provides an important selling point in dealing with prospects who want automatic heat but are concerned about a possible future "squeeze" on price or availability of fuel. If the type of fuel he uses should get out of hand either price wise or as to supply, he can easily switch to oil or gas as the occasion demands.

Builders also are emphasizing the freedom of choice as to heating fuel which the buyer gets in a home equipped with a convertible furnace. It is a well established fact that the choice of heating fuels is somewhat a personal matter. And, even though a person builds or buys a home for lifetime occupancy, circumstances may require that he sell. Builders are stressing the fact that he will find, in such case, that it is far easier to sell his home if the heating unit can be fired either by oil or gas by simple convertibility.

The ability to make more sales from a smaller inventory is another reason why heating dealers are enthusiastic about convertible equipment. In these times of unsettled prices, both dealers and consumers tend to buy "from hand to mouth", making it more difficult than ever for dealers to maintain a balanced stock. Convertible equipment offers a sensible solution to this

problem because it helps hold down inventory investment—yet minimizes lost sales due to not having the type of equipment the prospect needs. Heating dealers can safely anticipate a larger volume of sales in the new home market with convertible equipment that has the versatility that will appeal to those building to sell, as well as those building to occupy; that is attractively priced; that is compact in size for installations in small basements, first-floor utility rooms and kitchen; that is soundly engineered to provide completely automatic heat quietly, with full economy and maximum safety.

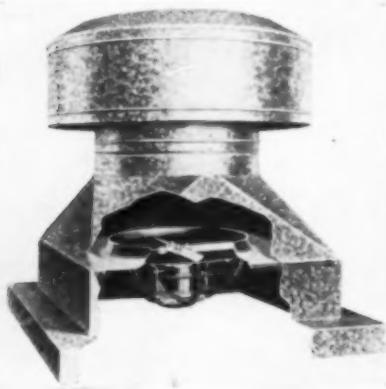
Convertible equipment that meets these requirements is now available from Century Engineering Corporation, Cedar Rapids, Iowa. The new line has been named the "Century Convertible" and is available in both hiboy and loboy styles, with interchangeable oil and gas burners. The size permits dealers to sell equipment for both small and medium size homes, where the big sales volume exists. For illustrated literature and full details, write today to Century Engineering Corporation, Cedar Rapids, Iowa.



—Century Engineering Corporation Photos.
New convertible furnaces shown with oil burners
....interchangeable gas burner fits same furnaces.

EQUIPMENT DEVELOPMENTS

Use Coupon on Page 109



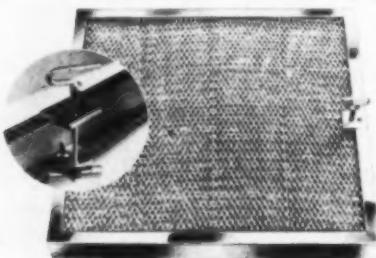
damper and inverted cone air guide which is said to guide outgoing air with least possible friction and to permit any degree of opening desired. Standard construction is of galvanized steel; other metals are available to meet special conditions.

Made both as a gravity ventilator and a powered unit. The latter form offers capacities from 630 to 25,700 cfm.

The Swartwout Company, 18511 Euclid Ave., Cleveland 12, Ohio.

Filter Handle Lock 181

New filter handle lock is designed for installation on any standard size of R-P Alumaloy grease and industrial air filters. In addition to being a universal holding device on air and grease filters, the new lock provides rattle-free fastening that compensates for possible variation in frames or for loosening due to wear.



The handle lock requires only one quick motion to secure or free the filter. Once assembled, a quarter turn of the handle in either direction moves the latch rod over a built-in cam which lifts the rod to clear any standard holding

frame flange. There are no loose or swinging parts to interfere with filter or frame maintenance.

Research Products Corp., Madison 10, Wis.

Package Coal Furnace 182

New package coal furnace, Model 900, has been developed to serve as a gravity or forced air furnace, with or without ducts, or as a circulating type space heater. When used as a furnace, it may be installed in basement or utility room. Forced circulation of warm air in winter is provided by an adjustable blower unit which may be installed at rear or on either side of cabinet.



Heating capacity is rated at 80,000 Btu at bonnet. Circulating blower will deliver up to 1,250 cfm of air. Fuel capacity is 100 lbs. Unit embodies the semi-automatic magazine feed principle and a built-in automatic heat regulator which provides thermostatic control of primary air. Important features include a built-in humidifier and removable ash container, $\frac{1}{2}$ bu. capacity.

Additional information on the Warm Morning furnace is available on request.

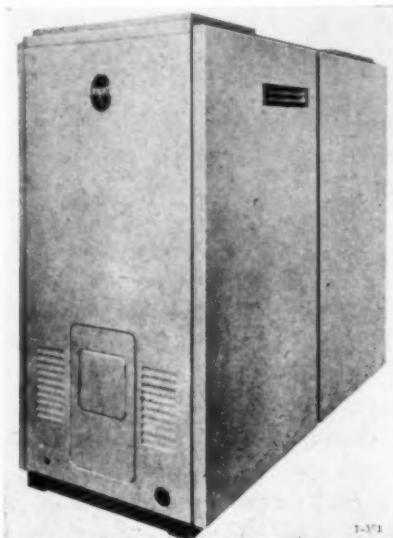
Locke Stove Co., 114 W. 11th St., Kansas City 6, Mo.

3-Ton Conditioner 183

Model 576 all-weather 3 ton conditioner features controlled humidity for summer operation by employing a "reheat" cycle, which the manufacturer claims is an exclusive feature. The model is shipped in

two completely assembled heating and cooling sections.

Additional features consist of a patented control circuit; simplicity of seasonal changeover, which is accomplished merely by the flick of a switch; ease of installation; Fiberglas insulation throughout; and absence of exposed bolts and screws.

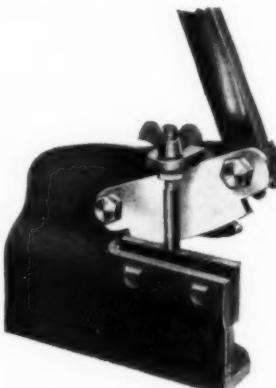


Further information on construction and operation of the conditioner is available on request.

Bryant Heater Div., Affiliated Gas Equipment, Inc., Cleveland 10, Ohio.

Slitting Shear 184

Steel slitting shear is latest addition to line of hand operated tools. Frame is of solid, one-piece construction; lever and gear segment is a steel forging; and blades are made of high grade tool steel.



Shear has a capacity of $3/16 \times 2$ in. bars and 10 ga sheets. Also useful for cutting $\frac{1}{8}$ in. angle iron.

W. A. Whitney Mfg. Co., 636 Race St., Rockford, Ill.

AMERICAN PHILLIPS SCREWS

Play "close harmony" with musical instrument makers in both these vital ways...



4-WINGED DRIVER CAN'T SLIP OUT
OF PHILLIPS TAPERED RECESS

1. "Sweet Music" in Production: Never a "sour note" of spoilage, delay or accident where these automatically straight-driving American Phillips Screws are used in assembly. Costly materials and hours of skilled workmanship are never wasted or lost. To the contrary, American Phillips Screws combine speed with precision so that *fastening time is cut 50%*, even on the fussiest work.

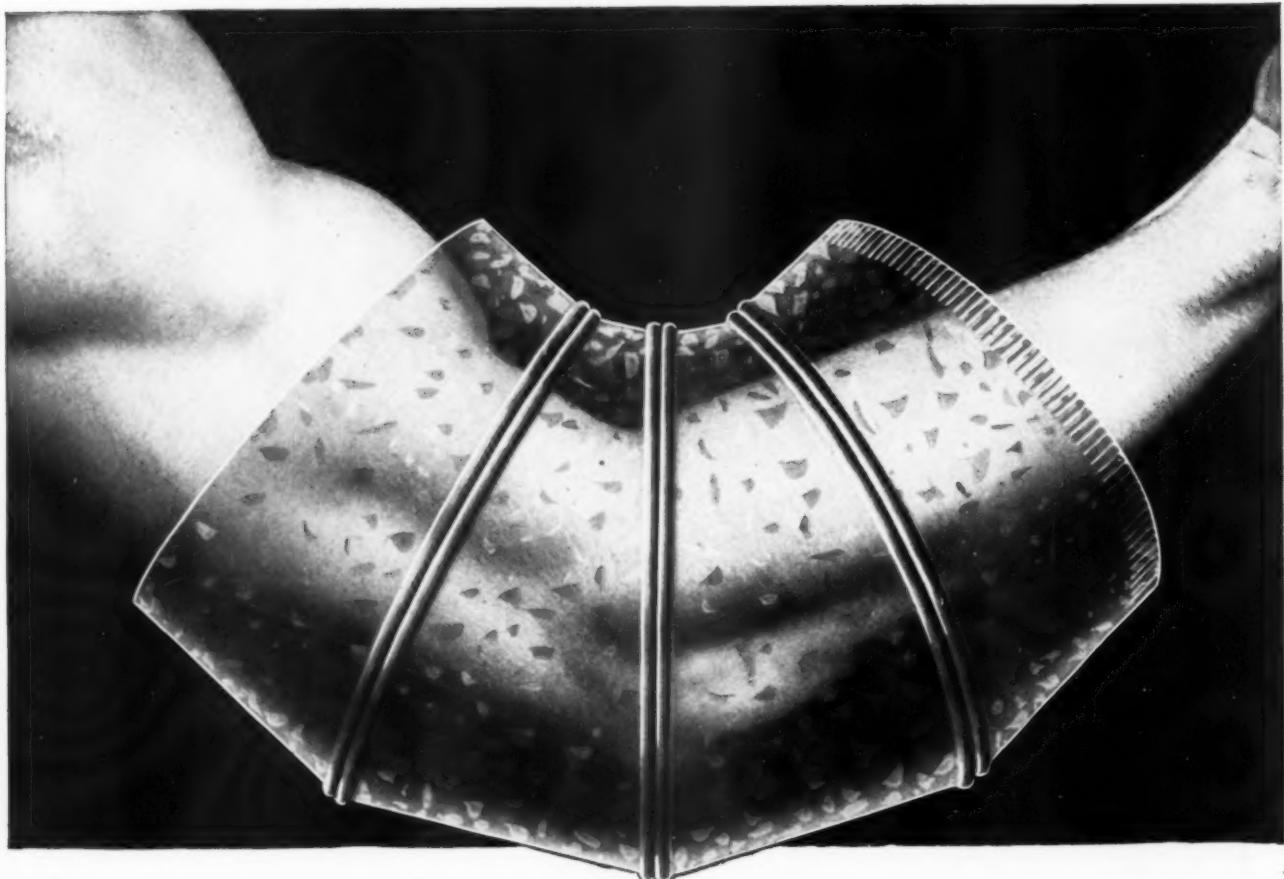
2. "Sweet Music" in Promotion: American Phillips Screws are "grace notes" in their clean, modern appearance on musical instruments and all other products...a signature of quality on the surface that certifies the quality within. Wherever you find American Phillips Screws, you find a product that sells well and stays sold. Write.

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND
Chicago 11: 589 E. Illinois St. Norristown, Pa. Detroit 2: 502 Stephenson Building

AMERICAN
PHILLIPS *Screws*



There's not a "MUSCLE-BOUND" Elbow in the whole Lamneck line!



Adjustable elbows that can *always* be counted on to *adjust* smoothly and easily are only *one* of the many labor saving—time saving—extra profit-making advantages you get with easy to handle, easy to install Lamneck.

Whether jobs require rectangular or round duct, or whether you're installing forced air* or gravity systems, Lamneck jobs figure faster—sell faster—finish faster—and add up to plenty of extra profits for you!

*P. S. Remember, only Lamneck has the exclusive Simplenic System for forced air. Saves up to 25% by eliminating need for increasers or reducers on main trunk. Get the facts. Write for catalog and name of nearest jobber.



CLAYTON & LAMBERT MFG. CO.
Louisville 10, Ky.

LAMNECK ANOTHER GREAT  PRODUCT



Exclusive Advantages—The ability of the Jetronic Fuel Burner to burn oil as gas is revolutionary. And it is all accomplished prior to ignition. The fuel oil is completely converted into a gaseous mixture in a special design pre-heated chamber. The hot gas is then mixed with the right amount of air with micro-accuracy by the Jetronic Air Turbulator and automatically ignites. The gas burns with an entirely smokeless, crystal-white, 2400°, super-hot flame . . . all carbon, sulphur and ferrous oxides found in fuel oil are completely consumed. It's pure—a new kind of heat, 700 degrees hotter than conventional type burners, and completely free of smoke, soot and odor.

Instant Conversion from Oil to Gas—is accomplished automatically by a trouble-free switch. Because Jetronic burns oil like gas, it burns gas too, without any change whatever. The Jetronic Fuel Burner makes the user secure—two fuels—one burner for both. And . . .

IT CAN BE INSTALLED IN ANY TYPE OF HOME HEATING PLANT!



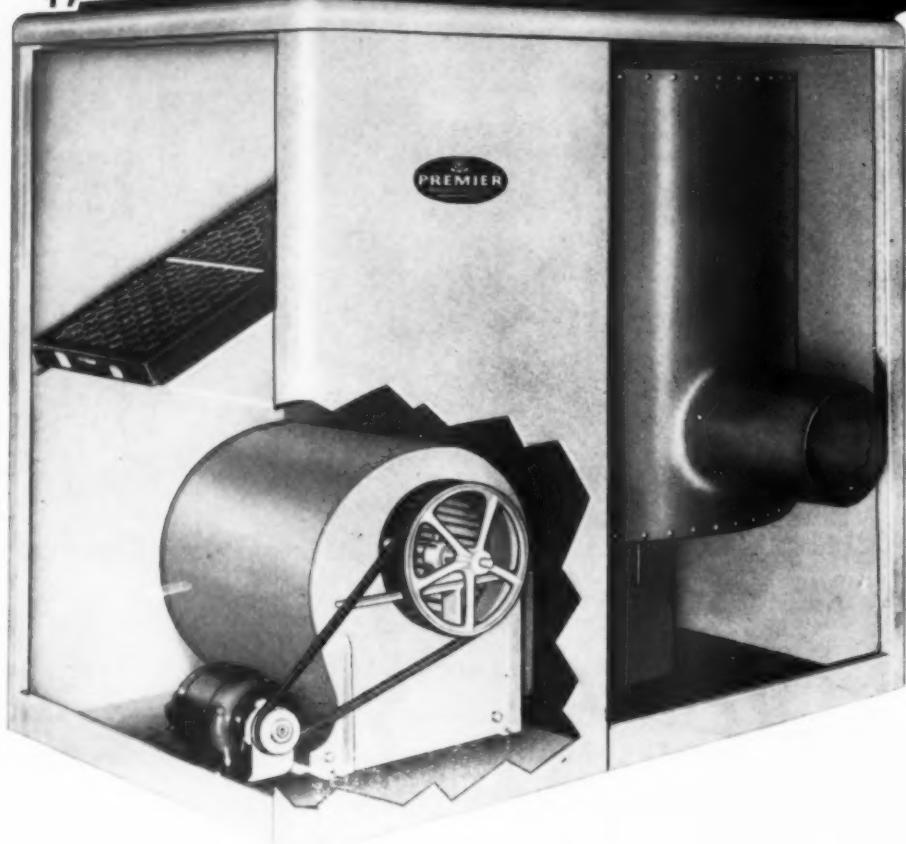
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literature and dealership franchise

Manufactured by Consolidated Industries, Inc.
Lafayette, Indiana

Jetronic



PREMIER Helps Dealers Keep Up Sales and Maintain Earnings



Here is a truly economical winter air conditioner! It's the PREMIER Model "SLB", especially made for that great market of buyers who appreciate the advantages of a heating system that can be fired with coal, gas or oil.

Unit includes furnace, blower and filters efficiently combined in a handsome enameled steel cabinet. Furnace is machine formed of heavy steel plate, riveted and welded permanently gas-tight. Crescent shaped radiator is also riveted and welded. Easy operating, roller bearing grates. Blower features exclusive PREMIER cast iron ends, full 1" shaft, and graphite-bronze bearings. "Quiet as a hushed whisper."

You'll be amazed by the moderate price of this quality-built air conditioner. Write today for catalog and price list.



PREMIER gives the Independent Heating Dealer the kind of a line and the kind of merchandising cooperation needed to do business in today's market.

The PREMIER line is tailor-made to fit today's buying demands. Here is the smartly styled, dependably-built, economically priced equipment that heating buyers want. You don't

have to be a super salesman to get business on this line, because every unit has extra quality, and extra sales appeal at low cost.

In addition PREMIER helps its dealers with the most complete and effective merchandising program ever offered — a program designed to help Independent Heating Dealers stay independent!

PREMIER FURNACE COMPANY, Dowagiac, Michigan
Heating . . . Air Conditioning . . . Automatic Fuel Burning . . . Cooling

Now...for the first time!

CIRCULAR AIR DIFFUSION FROM A SQUARE OUTLET



NEW SQUARE ANEMOSTAT Aspirating Air Diffuser Type E

ENGINEERS WANTED IT:

Up to the present, using a square air diffuser meant sacrificing performance for appearance. Now Anemostat has developed an *entirely new* square air diffuser . . . the Type E . . . that provides draftless air distribution over a full 360° arc.

This new patented Type E Diffuser retains the exclusive Anemostat *aspiration* principle. It draws room air, equal to 35% of the supply air, into the device, where it is mixed, within the unit, with the supply air before it is discharged in a multiplicity of planes.

ARCHITECTS WANTED IT:

Because of its square shape, this new diffuser harmonizes perfectly with rectangular and straight line design. It fits readily into standard size acoustical and egg crate ceilings. It can be combined with all types of lighting fixtures.

The Anemostat Type E is available in nine different neck diameters ranging from 4 to 14 inches.

CONTRACTORS WANTED IT:

It can be installed and adjusted quickly and economically by a new labor and time saving snap-on method. Equalizing deflectors also easily snap onto the inner assembly.

By adjusting the equalizing deflectors in the new Type E Anemostat, air can also be diffused in long, narrow or angular patterns to suit various conditions.

SEND FOR BULLETIN 29 which shows smoke test photographs and gives full information on the new Type E Air Diffuser.

ANEMOSTAT®

DRAFTLESS Aspirating AIR DIFFUSERS

ANEMOSTAT CORPORATION OF AMERICA
10 EAST 39TH STREET, NEW YORK 16, N.Y.
REPRESENTATIVES IN PRINCIPAL CITIES

"NO AIR CONDITIONING SYSTEM IS BETTER THAN ITS AIR DISTRIBUTION"

ANEMOSTAT CORPORATION OF AMERICA, 10 EAST 39TH ST., NEW YORK 16, N.Y.

Please send me a free copy of Bulletin 29 which fully describes the new Anemostat Type E Square Air Diffuser.

NAME

POSITION

COMPANY

ADDRESS

AC-12

This way to extra profits with ARMCO Stainless Steel

You sell satisfaction—at a good profit—when you install roof drainage systems of ARMCO Stainless Steel. On top of that, you stand to gain more jobs through valuable word-of-mouth advertising.

ARMCO Stainless is a strong, rustless metal that should last the life of the house. In gutters it withstands sagging under heavy loads of ice and snow—also resists cracking and buckling under extreme temperature changes.

There is little danger of valleys and elbows wearing thin and failing when ARMCO Stainless is used. This tough, smooth metal fights wear and abrasion caused by soot, dirt and roof gravel.

There are stainless hangers, hooks and nails, circles, shanks and other accessories to make each job completely corrosion-resistant. Remember—an all-stainless system will not discolor in service or stain adjoining surfaces.

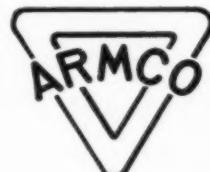
WITH ALL its advantages, handsome, durable ARMCO Stainless Steel costs no more than any other quality metal commonly used for roof drainage—frequently less.

In the shop, it can be readily cut and formed with standard equipment, making only minor adjustments. On the job, its great strength and

rigidity mean that longer lengths can be soldered together on the ground before installation.

Write today for a free copy of the useful booklet, "ARMCO Stainless Steel for Gutters, Conductor Pipe and Accessories." Armco Steel Corporation, 3099 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

ARMCO STEEL CORPORATION



LOOK AT THIS PRESS

It's designed to provide industry with low-cost, high production units that are highly flexible in design and operation . . . relieving heavier presses of short runs and lighter work. Presses are practically fool-proof in operation. Frame is extremely rugged. Fingertip controls are conveniently located at hand level. Available for immediate delivery, in standard width (between uprights) of 24"- 31"- 36"- 42" respectively. Available in special width up to 72" at small additional cost. Movable bed plates. Pumping unit has bypass relief valve which can be set at any pressure up to press capacity. Presses available for either vertical or horizontal operation. All Standard presses equipped with 2-speed built-in hand pumps for more sensitive and versatile operation.

READ → THESE "SPECS":

CYLINDERS: Standard Models furnished with 6" bore, 7½" stroke—spring return type; also 5" bore, 7½" stroke—spring return type. Above presses are standard. Following can be furnished at additional cost: Double Acting, 6" bore, 7" stroke; 6" bore, 11" stroke; 5" bore, 7" stroke; 5" bore, 11" stroke. Special long stroke cylinders also available, up to 48" in length, for incorporation in suitable press frames of our make.

PUMPING UNITS: These units can be supplied in various volumes and pressures, in a total of 13 combinations.

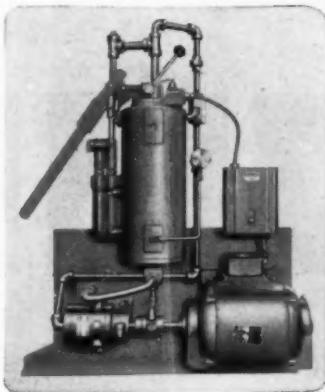
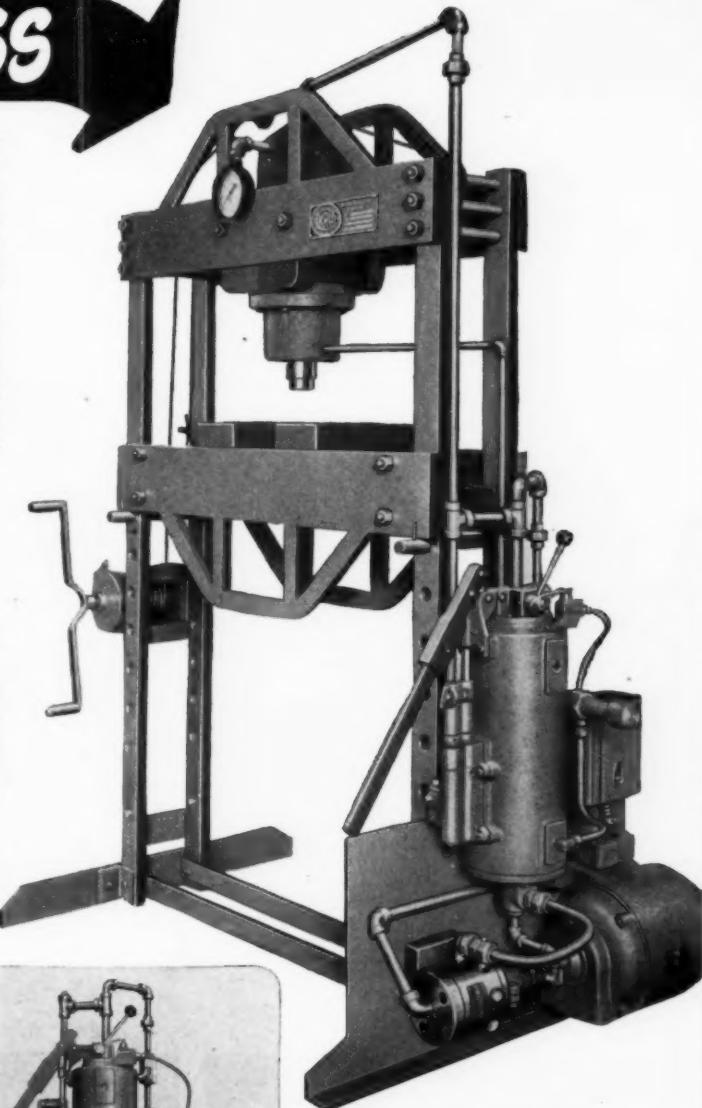
Presses include V blocks, Gauge, Motor Controls, Pressure Regulator, etc., complete and ready to attach to electrical source.

CHECK → THESE USES:

There are so many everyday production uses for these versatile KRW Hydraulic Presses that we have lost count. Here are a few of the more obvious . . . blanking, forming, bending, broaching, straightening, stamping, embossing, numbering, upsetting, laminating, pressing and hot or cold forging. KRW Engineers are daily developing other uses. If you have only a vague idea of how these presses might be used in your plant, let us have it in a rough form. We'll do the rest.

BEAT → THESE PRICES:

Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows, F. O. B. Factory: 25-ton press from \$727.00 to \$992.00. 50-ton press from \$806.00 to \$1058.00. 60-ton press from \$1070.50 to \$1135.00. 75-ton press from \$1198.00 to \$1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra. *Subject to change without notice.



MODERNIZE AND MOTORIZE YOUR PRESENT KRW PRESS with one of these compact motor drive units. They come complete ready to connect to your press. Require very little extra floor space. Write for conversion unit prices, giving the capacity and serial number of your press.

MAIL THIS COUPON

It will bring you all the money-saving facts about these low cost, high production hydraulic presses. Now is the time to get ready for the highly competitive days ahead.

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

Please send me complete information on KRW Motor Driven Presses as follows:

- 25-ton 50-ton 60-ton 75-ton presses
 motor drive conversion unit Press Cap.

Serial No.

Name
Address
City and Zone State

K.R.WILSON

215 MAIN ST. · BUFFALO 3, N.Y.

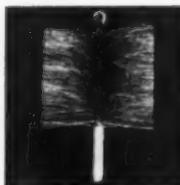
Schaefer BRUSHES

FOR PLUMBERS...FURNACE MEN...HEATING CONTRACTORS

Performance tested. SCHAEFER Brushes offer longer wear, better service, greater value—with the correct brush for every industrial and domestic use.

SCHAEFER Flue and Boiler Brushes of SILVER BRITE Rustproof Wire

SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.



SCHAEFER
Rectangular Flue Brushes

No. S-415—2" x 4" x 1½"
No. S-416—3" x 5" x 4½"



SCHAEFER
Boiler Brushes

No. S-393—1½" x 4" x 1½"
No. S-391—2½" x 6" x 4½"
No. S-392—3½" x 6" x 6½"



SCHAEFER
Boiler Brushes

No. S-399—2" x 4" x 6"
No. S-400—2½" x 4½" x 6"
No. S-401—3" x 5" x 6"



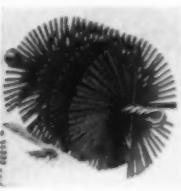
SCHAEFER
Boiler Brushes

No. S-399—2" x 4" x 6"
No. S-400—2½" x 4½" x 6"
No. S-401—3" x 5" x 6"



SCHAEFER
Single and Double
Spiral Flue Brushes

No. S-432—Single Spiral
—1" to 4" dia.
No. S-433—Double Spiral
—1" to 4" dia.
No. S-434—For small
Flues— $\frac{1}{2}$ " to
1" dia.



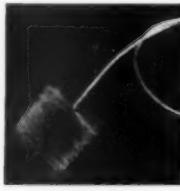
SCHAEFER Round Flue
Brushes of Single Spiral,
Flat Steel Wire

No. S-430—1" to 4" dia.



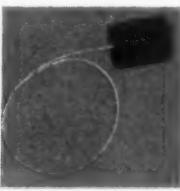
SCHAEFER Rectangular
Flue Brushes of Flat
Steel Wire—Spiral

No. S-420—2" x 3½" x 4"



SCHAEFER Furnace
Brushes of Silver Brite
Rustproof Steel

No. S-412—3", 4", 4½",
5" with 5 ft. handle.



SCHAEFER
Fibre Furnace Brushes

Selected Bassine fibre,
flexible wire stem, 4", 5",
6" dia., 48" and 60"
handle.

No. S-444-445



SCHAEFER
Chimney
Cleaning Brushes

No. 666—6", 7", 8", 10"
and 12" dia. round style
of Black Tempered Brush
Wire.
No. 666—6", 7", 8", 10"
and 12" dia. oblong style
of Flat Tempered Steel
Wire.



SCHAEFER
Wire Wheel Brushes
Solid Center Type of
crimped steel wire.
No. 276—6" dia. x 1¾"
face.
No. 278—8" dia. x 1¾"
face.
No. 280—10" dia. x 2"
face.



SCHAEFER
Handy Wire Brush

No. 816—For roughing,
soldering etc., 6" long,
tempered steel wire
trimmed 1½".



**Tin Handle Acid or
Dope Brushes**

Selected grade bristles in
tin ferrule. Width, $\frac{1}{8}$ ",
 $\frac{1}{16}$ ", $\frac{1}{32}$ ".



T. W. Flat Acid Brushes

Tinners soldering brush,
horsehair filling, 1¼"
width, 7½" overall.

Twisted wire handle.

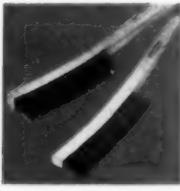


**Radiator or Condenser
Tube Brushes**

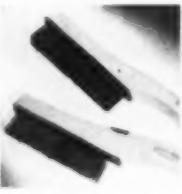
Twisted in wire handle,
selected hair or bristle.
Wide range of sizes.

No. 10— $\frac{3}{16}$ " dia. x 2" brush
x 16" overall.

No. 11— $\frac{1}{2}$ " dia. x 3" brush
x 8½" overall.



No. 810—Oil tempered
steel wire, trimmed 1¼",
hardwood block, 14" long.
Brush 6", 2, 3 or 4 rows.



SCHAEFER Shoe Handle
Wire Brushes

No. 812—Oil tempered
rust-proof wire, 5" brush,
2, 3, 4 rows. Trim 1¼",
overall 10".



SCHAEFER Straight
Back Wire Brushes

No. 800-11—Oil tempered
steel wire. Hardwood
block, 7½" x 2¾". Wire
trim, 1¾", 6 x 19 rows.



SCHAEFER Vacuum Cleaner Brushes

No. 1005—Bassine Fibre Brush, 10½" dia. tapered
to 8" dia. x 6 ft. long—48" handle with
threaded nipple at end.

No. 1000—Bassine Fibre Brush, 10½" dia. brush x
10" long. Handle 39" with threaded nipple
at end.



Wire Flue Brush and Extension Handles

4 ft. Handles with Nipple and Coupling.

5 ft. Handles with Nipple and Coupling.

6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

SCHAEFER BRUSH MFG. CO.
117 W. Walker Street Milwaukee 4, Wisconsin



**For
quieter
air
handling**

self-lubricating self-aligning, economical Randall Pillow Blocks



**STREAMLINED, ONE-PIECE
STEEL HOUSING PILLOW BLOCK**

Graphited phosphor bronze bushing in ball reservoir housing. Small cross section area permits maximum air flow.

Shafts roll silently, month after month, when they run on Randalls. Only Randall Pillow Blocks have bushings of graphited phosphor bronze or of sintered bronze in self-aligning, wool-felt-packed, oil reservoir housings.

Write for Catalog 49, with the complete story of Randall design features, descriptive data and specifications on the six basic models in the Randall Line.

RANDALL GRAPHITE BEARINGS, INC.

609 WEST LAKE ST., DEPT. 911, CHICAGO 6, ILLINOIS

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THE BROWN BEARING COMPANY
Portland 9, Seattle 4

THE BERRY BEARING COMPANY
Chicago 16

EDWARD D. MALTBY COMPANY, INC.
Los Angeles 15, San Diego
Phoenix, Honolulu
C. W. MARWEDEL
San Francisco, Oakland

MOFFATT BEARINGS COMPANY
Philadelphia 30, Baltimore, Richmond
Charlotte, Atlanta, Birmingham

SYRACUSE BEARING COMPANY
Syracuse 2, Buffalo 8, Niagara Falls
Rochester 13, Utica

TEK BEARING COMPANY
Albany, Boston, Bridgeport, Newark
New York, Providence, Waterbury

SALT LAKE HARDWARE COMPANY
Salt Lake City 9

CANADA

DOMINION BEARINGS, LTD.

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PUMPS & POWER, LTD.

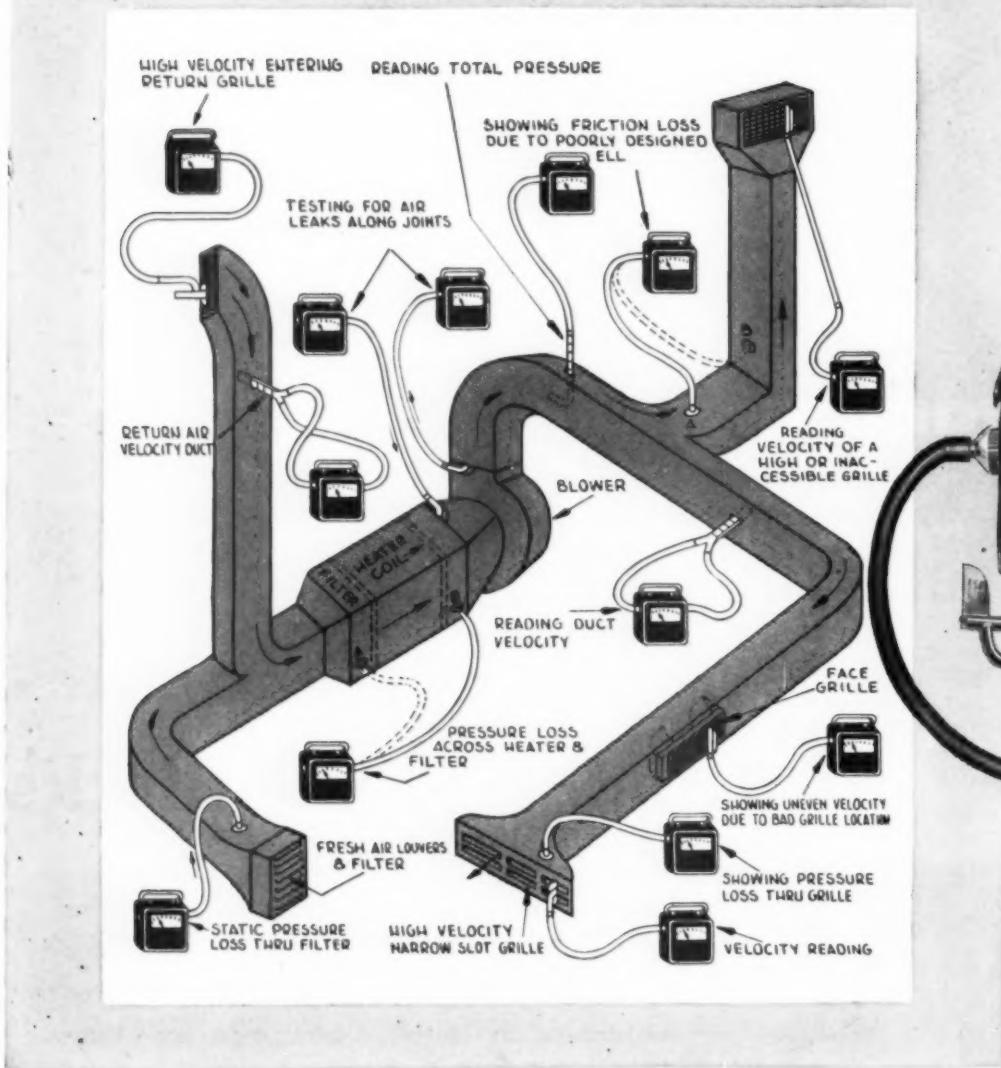
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CUBA

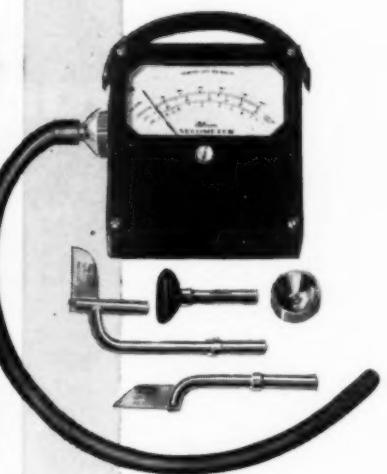
GOYANES Y ALVAREZ

Havana

For a balanced system . . .



TYPE 4-F Standard minimum set for heating and air conditioning air velocity measurements.



Use the instant direct-reading *Alnor* VELOMETER!

The type 4-F Velometer—especially designed for balancing a ventilating system. Furnished with standard jets, as illustrated—complete with carrying case and instructions. It will quickly pay for itself in convenience, accuracy and greater speed.

A LOOK at this drawing and you'll get an idea of the wide usefulness of the Alnor Velometer. For checking and maintaining old systems—and for help in making new installations—the Velometer is an all but indispensable instrument. It is the only instantaneous direct reading air velocity meter! No charts or calculations required—it's easy to understand, easy to use. As it has for thousands, it can simplify and speed up all your air conditioning and ventilating work.

Only \$82.50 f.o.b., Chicago • USE THIS COUPON!

Illinois Testing Laboratories, Inc.
Room 538, 420 North La Salle St., Chicago 10, Illinois
 Send me a copy of Bulletin No. 2448-O
 Send me . . . Velometers at \$82.50 each. (Enclose check, money order, or purchase order.)

Name _____
 Company Name _____
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Alnor

PRECISION INSTRUMENTS
FOR EVERY INDUSTRY

ILLINOIS TESTING LABORATORIES, INC.

Chicago 10, Illinois

Customers
getting
"CHOOSEY"?



Superfex Automatic Water Heaters

Superfex full automatic water heaters, oil or gas fueled, are available in fifty or thirty gallon capacities. Center-stack heated. Heavily insulated. Superfex heated. "Midget" Pilot saves money.

Better Sell Superfex!

LOOK at what Superfex gives you

CHOICE of the exclusive "Homogen-Air" three-stage fire with synchronized blower*; two-stage system or gravity furnaces, either gas or oil fired.

CHOICE of basement furnaces, floor furnaces, high-boys or suspended units.

CHOICE of vaporizing or gun-type oil burners.

CHOICE of complete furnaces or conversion burners.

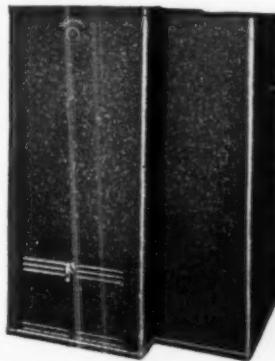
CHOICE of natural, manufactured or L.P. gas burners.

HIGHEST QUALITY CONSTRUCTION; stainless steel oil burner parts; high efficiency heat exchangers; Double-wall casings of heavy gauge steel; Sealed-to-steel baked enamel finish.

AND heating engineering service backed by the finest development laboratory in the industry.

*The Superfex "Homogen-Air" is the *only* system that *continuously* delivers the right amount of heat from a three-stage fire, and *continuously* circulates it. "Homogenized" effect of constant mixing gives even heating with never more than 4° difference, floor to ceiling. The most critical buyer likes the added VALUE in this extra comfort at less cost.

*Every Season Is Your
Busy Season With Superfex*



MODEL 62 Gas, 100,000 BTU. Input

With this complete line, you can be GLAD that customers are getting tougher about the VALUE they get for their money. The PLUS features of Superfex, the things no other furnace has, provide Superfex dealers with the greatest heating values in ANY kind of a market.

Superfex

GAS OR OIL FURNACES

Made by PERFECTION STOVE COMPANY
7095-E Platt Avenue • Cleveland 4, Ohio



What
FAN ENGINEERING
Gives You . . .
808 FACT-FILLED
PAGES ON:
Properties of Air
Humidity
Heat
Heat Transmission
Fluid Flow
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Fans
Heating
Ventilating
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and tables, all for
\$6.00 (our cost).

SINCE 1914, FAN ENGINEERING has been THE handbook for the man engaged in Air Engineering. It met the big need for an authoritative, yet handy pocket size reference book with quick, accurate answers to the complex problems of air handling. Revised and enlarged four times, FAN ENGINEERING is completely up-to-date — and more popular with engineers than ever before.

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VENTILATING
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AIR WASHING
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AIR TEMPERING
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INDUCED DRAFT
PRESSURE BLOWING

EXHAUSTING



You SHOULD HAVE THIS *Dux-Sulation* SAMPLE KIT!

NOW—IN HANDY FORM:

ACTUAL "SWATCHES" PLUS USEFUL INFORMATION

Yes, you should be familiar with Asbestos Protected Dux-Sulation—the flexible duct insulation with "nine lives"! Not only does this unusual product save fuel, but it deadens metallic noise, offsets overloads, reduces the power load, prevents condensation, prevents rust, absorbs sound, reduces vibration—and besides, it improves the appearance of the duct system.

PERFECT FOR ANY TYPE DUCTS . . .

Asbestos Protected Dux-Sulation can be applied to either the inside or the outside of round, rectangular or irregular shaped ducts and fittings. It won't crack, chip, or buckle, and its unique flexible construction makes it a superior insulation for all types of warm air heating, air conditioning and ventilating duct work.

SEND FOR
YOUR NEW
SAMPLE KIT
TODAY!

ASBESTOS PROTECTED DUX-SULATION WON'T DETERIORATE . . .

It is a rot-proof, mildew-proof, insect-proof duct insulation that is durable and cuts down maintenance costs. Because of its comparatively light-weight, interwoven Asbestos membranes and smooth moisture-resistant finish, it does not tend to pull away from the duct surfaces.

IT'S SAFE AND EASY TO APPLY . . .

You can cut down labor costs by specifying Asbestos Protected Dux-Sulation on all your jobs. No screws, wires, lugs or bolts are needed. Every roll of $\frac{1}{2}$ " and 1" thick comes complete with a special adhesive and asbestos protected tape for covering the corners and joints. Asbestos Protected Dux-Sulation comes in convenient to handle and stock rolls, 36" wide, containing 100 square feet.

Check with your jobbers today about prices of Dux-Sulation.

Grant Wilson, Inc.

22ND FLOOR, BOARD OF TRADE BUILDING,
CHICAGO 4, ILLINOIS

Please send me your new Dux-Sulation Sample Kit immediately.

Name

Address

City State



Boost your employee-participation in the Payroll Savings Plan and you boost your production!

You are skeptical? Then consider this logic: The more U. S. Savings Bonds an employee holds, the more secure he feels. The more secure he feels, the greater his peace of mind—the more contented he is with his job. Results? Less absenteeism, less labor turnover, fewer accidents. *End result: increased production.*

And you needn't depend on theory alone. For those company benefits of the Payroll Savings Plan are borne out in the experience of more than 20,000 companies promoting the Plan.

LONG-RANGE BENEFITS, TOO

Bond sales spread the national debt,

thus increasing our national economic security. And, of course, what's good for that is also good for you and your business.

The individual Bond Buyer gets back \$4, when his Bonds mature, for every \$3 he invested. That's a boon for him, and—multiplied by millions of Bond holders—represents a huge backlog of purchasing power that will help assure national prosperity through the years ahead.

IT'S EASY TO BOOST PARTICIPATION

1. See that a top management man sponsors the Plan.
2. Secure the help of the employee organizations in promoting it.
3. Adequately use posters and leaflets

and run stories and editorials in company publications to inform employees of the Plan's benefits to them.

4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Nation-wide experience indicates that 50% of your employees can be persuaded to join—without high-pressure selling. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. He is listed in your phone book.

The Treasury Department acknowledges with appreciation the publication of this message by

AMERICAN ARTISAN



This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

NIAGARA NIAGARA NIAGARA

Gas Coal Oil

FURNACES FURNACES FURNACES

Combustion chambers of cast iron or steel are included in the line of Niagara gas-fired units, both gravity models and completely automatic winter air-conditioners. Two vertical models meet the requirements for basementless homes and apartments. Vertical models are shipped as complete package units. All gas furnace cabinets attractively finished in Hammerloid enamel.

Here's a really complete line of coal furnaces—round and square cased cast iron; round and square cased steel; and coal fired winter air conditioners.

Completely automatic units of lasting attractiveness and dependable, economical operation with gun type pressure burners. All cabinets Hammerloid enamel.

... and merchandising helps

Niagara colorful folders, window signs, decalcomanias, electric signs, catalog sheets, sales portfolios, and other merchandising helps assist you in selling Niagara to your prospects.



THE Niagara line is a quality line—57 years of furnace manufacturing demonstrate that the reputation of Niagara is well established.

The Niagara line is complete—gas, coal, and oil in a range of 33 sizes and models which meet any residential demand for warm air heating.

And Niagara believes that the dealer should make a profit while serving his customer with satisfactory heating at reasonable cost. Write for complete details of Niagara furnaces and Niagara merchandising helps.

NIAGARA FURNACE DIVISION
The Forest City Foundries Co.

2500 West 27th St.
Cleveland 13, Ohio

NIAGARA

GRAVITY AND WINTER
AIR-CONDITIONING UNITS



Special Assignment FOR A TRIO OF EXPERTS

Three types of Bryant equipment, all operated on LP-Gas, provide the heating comfort in this newly completed Albany, Georgia, automobile agency. Showroom and offices are winter air-conditioned. Well-placed unit heaters maintain constant comfort in the large service department and garage. An individual heater, which supplies welcome warmth by both radiation and circulation, guards the comfort of mechanics and other employees in their locker and shower room. It's a case where more than one type of heating unit is needed to provide adequate heating, efficiently and economically.

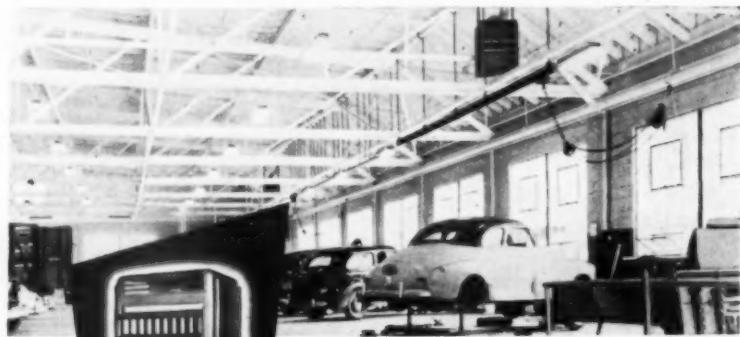
When your heating job requires diversified equipment, specify *all* your needs from the most complete line of gas heating equipment in the nation—the Bryant Line. You get uniform quality in every type of unit, and you're sure of *expert* performance, on any gas, for every Bryant unit is experience-proved. Your Bryant Distributor stands ready to help you select the units that will help you sell your job.



Expert on body comfort is the Bryant Model VC-426 Radiant Circulating Heater, installed in employees' locker and shower room. Heating Contractor for Albany Motors Co. building is Vance J. Law of Consumers Gas Company, Albany, Georgia.



Winter air conditioning of Albany Motors Co.'s beautiful showroom is assigned to the Bryant VS-304. Architect is Richard V. Richard of the firm of Dennis and Dennis, Architects, Richard V. Richard, Associate, of Albany, Ga.



Bryant Model US-322 Unit Heaters get the call for the job of heating Albany Motors' vast service department and garage, part of which is shown above.



Let the pup be furnace man
... and water boy, too!

bryant
AUTOMATIC HEATING

BRYANT HEATER DIVISION
Affiliated Gas Equipment, Inc.
Cleveland, Ohio • Tyler, Texas

THE MOST COMPLETE LINE OF GAS HEATING EQUIPMENT IN THE NATION



Bigger Value for Every Job

CHEVROLET ADVANCE-DESIGN TRUCKS



It takes a truck operator to really evaluate a truck. Yes, the man behind the wheel is the one who can best appreciate the worth of powerful yet economical performance . . . extraordinary load capacity . . . lasting quality, ruggedness and handling ease. He's the one who recognizes the advantages of new, improved features—of greater comfort and convenience for the driver. And these men in the drivers' seats—these experienced truck operators across America—know that Chevrolet trucks deliver more of the value factors they want. They know that Chevrolet trucks cost less to operate, less to maintain, and have the lowest list prices in the entire truck field. That's why they use more Chevrolet trucks than any other make! Your Chevrolet dealer will give you the facts in detail!

CHEVROLET MOTOR DIVISION, General Motors Corporation,
DETROIT 2, MICHIGAN

TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated because the gears are always in mesh. Faster shifting maintains speed and momentum on grades. Available in series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as the world's greatest economy for their size!

Chevrolet trucks have the famous CAB THAT "BREATHES"*. Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

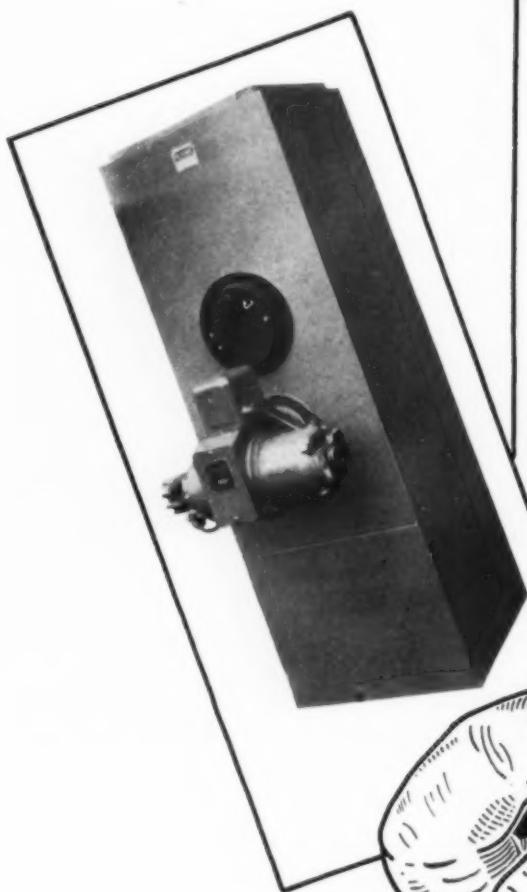
Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3600 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydovac Power Brakes in Series 5000 and 6000 Models • Multiple Color Options.

*Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.

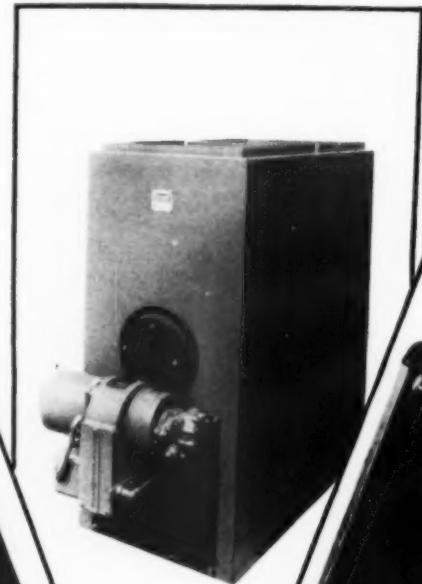
CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

3 NEW QUIET AUTOMATIC AIR CONDITIONING FURNACES SPECIALLY DESIGNED FOR THE SMALLER HOME

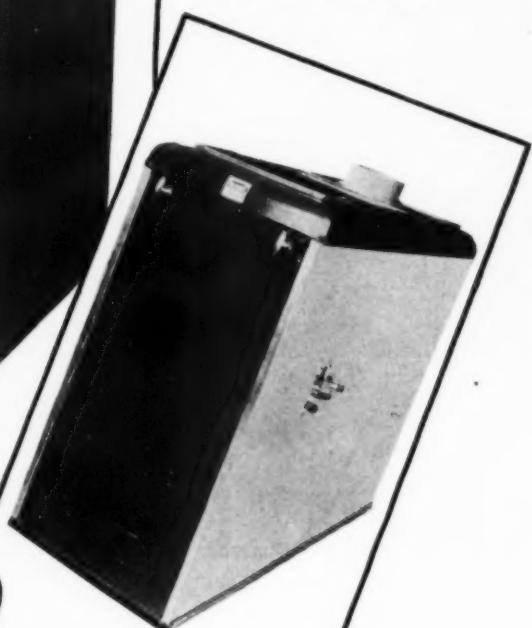


HIGH BOY, MODEL 65.
Oil fired. Completely assembled at the factory. Saves 4 to 6 hours in assembling and looking for parts. Stainless Steel combustion chamber. BTU 65,000. Size 57" x 20" x 24".

Write for full details
and specifications.



← LO-BOY, MODEL 85.
Oil fired, completely assembled. Stainless Steel combustion chamber. Fully automatic, fully approved. BTU 85,000. Size 38" x 20" x 42".



←
MODEL 90. Oil fired, completely assembled. Minneapolis controls. Westinghouse equipped, flange mounted Quiet Automatic oil burner. Completely enclosed. BTU 90,000. Size 56" x 13" x 43".



QUIET AUTOMATIC BURNER CORP.

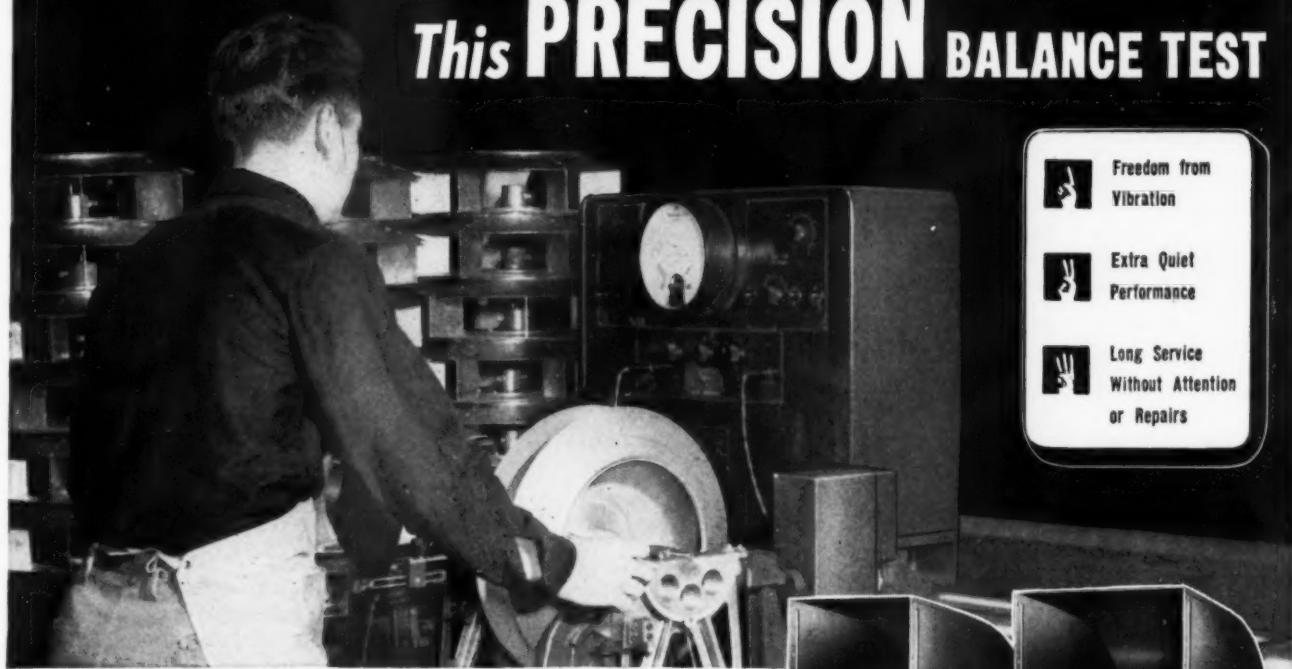
Newark 4, N. J.

J. Gordon Kaveny (President)
33-35 Bloomfield Avenue, Newark 4, N. J.

Also Manufacturers and Engineers of
A COMPLETE LINE OF CONVERSION BURNERS
MADE IN 6 SIZES From 1 Gal. to 30 Gals. Per Hr.

Every Wheel Must Pass - with Honors -

This PRECISION BALANCE TEST



- Freedom from Vibration
- Extra Quiet Performance
- Long Service Without Attention or Repairs

No Wonder So Many Manufacturers Furnish Clarge as Standard!

Wheels in perfect balance are of utmost importance — if your blower units for heating and air conditioning are to give satisfactory, long-time service.

That's why we take such great pains with balancing operations here at Clarge Fan! Every wheel is tested on highly sensitive, electro-dynamic machines as shown above. Both static and dynamic balance are obtained simultaneously — and to within precision limits.

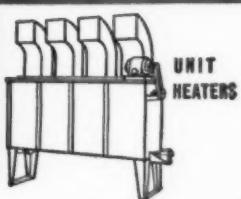
Yet accurate balance is but one of the many highly desirable features found in Clarge Blower Assemblies.

To meet your future requirements, it will most certainly pay you to investigate these fans.

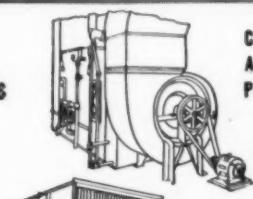


Built in ten sizes in both types as illustrated — capacities from 200 to 7800 c.f.m. Or wheels only can be furnished in the same ten sizes.

SOME OF OUR OTHER PRODUCTS

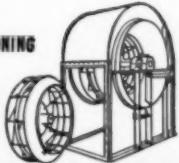


UNIT HEATERS



CENTRAL STATION AIR CONDITIONING PLANTS

LARGE AIR CONDITIONING AND VENTILATING FANS



AIR WASHERS



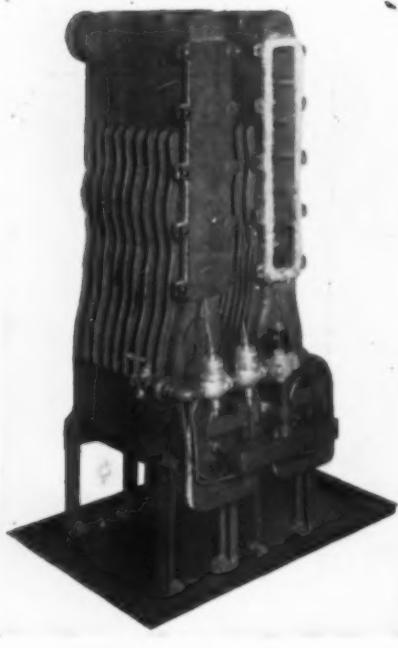
CLARGE

FAN COMPANY

Kalamazoo, Michigan

APPLICATION ENGINEERING OFFICES
IN ALL PRINCIPAL CITIES

... built to last



Illustrated above is the Monocast Cast-Iron Heat Exchanger — the heart of Gasmaster units. (Right view, inspection plate removed.)



GASMASTER WINTER AIR CONDITIONER

Models 903-904 are A.G.A. approved for Natural, Mixed, Mfd., L.P. and L.P. Air gases —100,000 Input.

No cracking or creaking due to expansion and contraction. Because of the large cast iron exchangers, a smooth almost flat heat curve is obtained. Two and three fan operations per cycle of the gas burner are attained regularly.

Units are equipped with Minneapolis-Honeywell solenoid or diaphragm gas valves as standard. Basso pilotstats and burners.

All controls are enclosed.



The New GASMASTER GAS FIRED WINTER AIR CONDITIONER

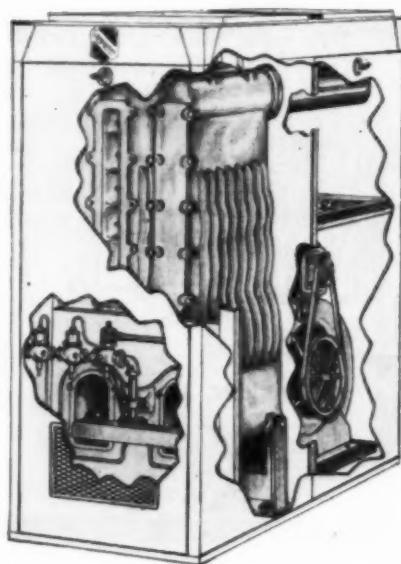
These highly efficient units are built around the Monocast-Cast-iron Heat Exchanger which is scientifically designed and constructed to produce an abundance of heating surface, extra long fire travel, and the correct wiping action of air over the entire outside surface of the heating element, creating a high standard of efficiency in the operation of the unit. For ease of servicing a clean out plate is located on the exchanger.

The cast iron heating element permits an unusual standard of performance, eliminates expansion and contraction noises, and retains enough heat to carry over from one burner operation to another. This also provides more even heat throughout the home resulting in absolute proof of a well designed, efficient installation and consequent customer recommendations for you.

The GASMASTER line is available in five sizes from 50,000 to 200,000 Btu for use on practically any type of installation. Check over the units shown here and then write us for more descriptive information. A postcard will do the trick!

TWIN CITY GAS SPECIALTY CO.

Manufacturers
710 WEST 27th STREET
MINNEAPOLIS 8, MINNESOTA





**FOR DUCTWORK
NOTHING BEATS**

BETH-CU-LOY

Let's be realistic about sheets. Does your average customer ever express a preference for a particular type, grade, gage or brand of sheets when he signs a contract with you for a duct job? Isn't it true that he is more often interested in how much the finished job will cost, how it will operate, how long it will last, and how it will look?

This means that you, the sheet-metal contractor, are the one who must select materials that can meet these requirements at a low initial cost.

Beth-Cu-Loy galvanized sheets will help you do this. They are made from copper-bearing steel that has more than double the resistance to atmospheric corrosion found in plain open-hearth steel. On top

of this they have a heavy, tight coating of zinc for additional protection against rust.

As far as price is concerned, Beth-Cu-Loy galvanized sheets sell for only a few cents more than ordinary galvanized sheets. This small difference buys many times the amount of service and customer satisfaction.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation*



Beth-Cu-Loy *GALVANIZED* Steel Sheets

IMPROVE YOUR KNOWLEDGE OF AIR CONDITIONING

SEND TODAY FOR
Samuel R. Lewis'

"AIR CONDITIONING FOR COMFORT"

288 Pages— $6\frac{1}{4}$ " x $9\frac{1}{4}$ "—Illustrated—
Cloth Bound—\$2.00

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Several complete examples of correct design procedure are given, together with forms for recording the design data, the proper filling-in of which are explained step-by-step.

The chapter devoted to Psychrometry presents nineteen different formulas for psychrometric calculations. In illustrating the correct use of these formulas, Mr. Lewis applies both the psychrometric tables and charts in order to render both devices thoroughly understandable.

OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume one of the most readable and complete books on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Use the coupon at the right to order your copy now.

KEENEY PUBLISHING COMPANY
6 N. Michigan Ave. Chicago 2, Ill.



\$2.00

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- CHAP. 2—Heat and Air
- CHAP. 3—Air Conditioning Standards
- CHAP. 4—Air Conditioning and the Human Body
- CHAP. 5—The Psychrometric Table and Chart
- CHAP. 6—Humidity Controllers and Control
- CHAP. 7—Heat Transmission Through Barriers
- CHAP. 8—Ventilation, Solar and Appliance Heat
- CHAP. 9—Heating Systems
- CHAP. 10—Air Conditioning Systems
- CHAP. 11—Air Conditioning Apparatus
- CHAP. 12—Refrigeration and Refrigerants
- CHAP. 13—Refrigeration Compressors and Condensers
- CHAP. 14—Refrigeration Evaporators and Auxiliaries
- CHAP. 15—Record Forms for Heating and Cooling
- CHAP. 16—Air Distribution
- CHAP. 17—Water in Air Conditioning
- CHAP. 18—Noise and Its Control
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- CHAP. 20—Codes and Operating Suggestions
- 10" x 16" Psychrometric Chart.....
- Inside Back Cover

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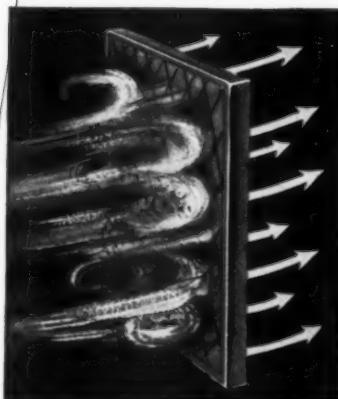
Enclosed is \$2.00 for a copy of AIR-CONDITIONING FOR COMFORT. If this book should prove unsatisfactory, I will return it within 15 days for a refund.

NAME.....

STREET.....

CITY & STATE.....

YOU CAN SELL THE LADIES BECAUSE HOMES STAY CLEANER!



REX

AIR-PAK

Good Looking! Built to Last!

Rex Air-Pak is built to give years of continuous service. Sight-feed oil gauge and bearings holds twice as much oil as conventional bearings. Requires oiling no oftener than once every two years.



FEATURES

- Green Baked Enamel Casing
- Self-Aligning Bearings
- Adjustable Cut-Off Plate
- All-Welded Blower Housing
- Large Capacity Blower
- All Sizes . . . 40,000 to 400,000 BTU per hour.

Blower-Filter

Every woman is looking for a way to make housekeeping easier. Rex Air-Pak does just that by literally vacuum cleaning the entire air content of a house more or less continuously.

All airborne dust, dirt and pollen are trapped by Rex Air-Pak's filters. Result: Walls, draperies and furniture stay cleaner because the dust is removed.

So don't overlook the sales power of *clean heat!* When Rex Air-Pak is added, any gravity furnace will deliver clean heat . . . plus economical floor-to-ceiling comfort.

Write us today for catalog No. 253 and free promotional literature. Don't delay. You'll find Rex Air-Pak easy to sell.



Air
CONTROLS INC.



Div. of THE CLEVELAND HEATER COMPANY, 2310 Superior Avenue, Cleveland 14, Ohio

WHEN IT COMES TO FURNACE CEMENTS



There's
NO Substitute for
STRENGTH
AND
PERMANENCE

THAT'S WHY THERE'S **NO SUBSTITUTE FOR**
Grant Wilson ASBESTOS FURNACE CEMENT

All furnace cements may look alike in the container, but when they are applied there is a great difference in workability, permanence and strength characteristics.

**ASSURES GASTIGHT, SMOKETIGHT
JOINTS—PREVENTS DANGER**

Grant Wilson Asbestos Furnace Cement eliminates very real dangers that result from heating plants that do not have tight joints—and prevents unfortunate accidents that can occur through the escape of furnace gases and smoke.

FIREPROOF, ODORLESS, ACID-PROOF

Another important feature about this supreme furnace cement is that it will not deteriorate—remains fireproof and acid-proof. Furthermore, it is odorless, and is therefore more pleasant to apply and does not leave an offensive odor in the basement.

EASY TO WORK WITH

This product has high workability—is easy to apply and will not crack or crumble. Contractors all over the nation tell us that Grant Wilson Asbestos Furnace Cement is the most satisfactory furnace cement they have ever used.

A Product of

Grant Wilson, Inc.

Board of Trade Building, 22nd Floor
Jackson Boulevard at La Salle Street
Chicago 4, Illinois

Write for a free sample and descriptive literature.



See your Jobber
today for prices.

Take it from Perry Dewey...

**"A Monel job properly installed
will not cost more to apply
than any other metal!"**



"In working with Monel* Roofing Sheet," said Perry S. Dewey in a recent interview, "our men use exactly the same methods as they do with other roofing metals.

"They find it easy to work with Monel—especially since the new soft-temper sheet has been available. It's not only easy to cut and bend, but ductile enough to stand being bent into intricate shapes and joints without cracking.

"Standard, recognized procedures can always be followed in the fabrication and installation of sheet metal parts made of Monel Roofing Sheet. That's why I say a Monel job properly installed will not cost more to apply than any other metal."

Yes, Mr. Dewey, and the somewhat higher cost of material pays for itself ... with the life-of-the-building service that a Monel roof provides.

The reason is simple. With superior corrosion resistance, plus high strength and toughness, soft-temper Monel Roofing Sheet has successfully withstood some of the most destructive roofing conditions in the country. These same properties also make it possible to use thinner-gauge sheet for roofing, penthouse siding, and a long list of roofing parts such as downspouts, leaders and skylight frames.

For example, a reduction of two full gauges in sheet thickness is frequently possible on a batten seam roof. An even greater reduction can often be made on louvers, ventilators and gutters.

You owe it to yourself to get all the important facts about Monel Roofing Sheet. This economical nickel-copper alloy is being written into more and more specifications for public buildings, institutions and factories every day!

SEND FOR THESE!

Of course, you'll want to prove to your own satisfaction that Monel Roofing Sheet really is easy to work with. And you can do just that with the free test sample we'll send you. Cut it, bend it, solder it—see what a cinch Monel is to work with, how adaptable it is to the fabricating methods you already know and use!

With your test sample, we'll also send our two bulletins, *Monel Roofing Sheet—Basic Application Data* and *The Soft-Soldering of Monel Roofing Sheet*. You'll find both helpful. And you can get them quickly—along with your free test sample of Monel Roofing Sheet—by writing your name and address on the coupon and mailing it now.

*Reg. U. S. Pat. Off.



THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

**MAIL THIS COUPON
for free test sample
and helpful bulletins!**

MONEL*...for the life of the building

Architectural Section
The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

I'd like to put Monel Roofing Sheet through its paces. Without placing me under any obligation, please send me free test sample and copies of your two bulletins.

Name.....

Street.....

City.....Zone.....State.....

A. A. 9-49

"We built our reputation for Precision Work on Stainless Steel"

(ALLOY MANUFACTURING COMPANY)



LIKE so many other metal shops fabricating Stainless Steel equipment, Alloy Manufacturing Company, Pittsburgh, Pa., has found that Stainless calls for precision workmanship, and, conversely, precision workmanship calls for Stainless Steel.

General Manager James L. Daniell of Alloy Manufacturing says, "Stainless Steel's uniformity and toughness make it particularly suitable for precision jobs where tolerances are often plus or minus $\frac{1}{16}$ " or less. Then when you add the strength, durability and handsome appearance that Stainless provides, it's easy to see why Stainless pays off in business gained, in labor saved, and in greater profit."

Alloy Manufacturing Company executives include Sales Manager Averell E. Daniell, General Manager James L. Daniell, and Chief Engineer D. M. Field. Tackling tough production jobs comes naturally to the Daniell brothers—both were All-American tackles on the gridiron, Jim at Ohio State and Ave at Pitt.

Alloy Manufacturing, like other fabricators, has found there is no difficulty in working with Stainless Steel. "We put Stainless through the paces every day," Mr. Daniell reports, "and find that its performance in brake, shears and rolls equals that of less durable metals. Actually, in many instances, Stainless is easier to fabricate."

Throughout the industry, fabricators have found that the higher standards of workmanship that Stainless demands are carried over when working with other materials, so that the ultimate effect is better workmanship on every job that leaves the shop.

Large shop or small, you, too, can establish a business-building reputation for precision workmanship with Stainless Steel. Especially if you use U·S·S Stainless Steel. You'll find this perfected, service-tested Stainless so uniform in finish and in fabricating qualities that once you've set up a fabricating procedure the work will go through your shop with the least trouble and delay.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • CARNEGIE-ILLINOIS STEEL CORPORATION, PITTSBURGH & CHICAGO
COLUMBIA STEEL COMPANY, SAN FRANCISCO • NATIONAL TUBE COMPANY, PITTSBURGH • TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST • UNITED STATES STEEL EXPORT COMPANY, NEW YORK



U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

B-1602

AIRTEMP DEALERSHIPS AVAILABLE!

Investigate today-

**Sell the famous Chrysler Airtemp Heating and
Air Conditioning Products—Big Market—
Strong Demand—Good Profits**

● You'll find Chrysler Airtemp products a fine line to sell—well known and highly regarded—nationally advertised and in good demand. They are designed and built to high standards for dependable performance and long life.

Here are *quality* products priced to meet the needs of home, business and industry. Prod-

ucts to sell 12 months a year assure you profit opportunities in every season. And you'll find we back our dealers with close cooperation in advertising, promotion and field engineering service.

Investigate this opportunity while it still exists. Write today—without obligation—for full details. Or mail the coupon.

NATIONALLY-ADVERTISED PRODUCTS FOR YEAR-'ROUND SALES

(you can handle heating or air conditioning separately if desired)

Gas and Oil-Fired Furnaces and Winter Air Conditioners • Gas and Oil-Fired Boilers • Oil, Gas and Electric Water Heaters • Oil Burners • Coal Furnaces • Convertible Winter Air Conditioners for gas, oil or coal • Year Around Air Conditioning Units (Heats and Cools) • Anthracite and Bituminous Domestic Stokers • Blower Units for Furnaces • Stoker-Fired Water Heaters • Room Air Conditioners • Packaged Air Conditioners • Commercial Refrigeration • Condensing Units • Central Systems Cooling Equipment • Marine Refrigeration • Water Cooling Towers.



Chrysler Airtemp

"PACKAGED" AIR CONDITIONING
CENTRAL STATION SYSTEMS

HEATING AND COMMERCIAL REFRIGERATION

AIRTEMP DIVISION OF CHRYSLER CORPORATION

DAYTON 1, OHIO

In Canada: Therm-O-Rite Products, Ltd., Toronto



AIRTEMP DIVISION, CHRYSLER CORPORATION
DAYTON 1, OHIO

Send immediately full details about the Chrysler Airtemp dealership arrangements, without obligation.

Name _____

Company _____

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City _____ Zone _____ State _____

A.A. T-40

here's one place
you need
"High Pressure"



**HEIL PRESSURE ATOMIZING
BURNERS BURN OIL BETTER...
RETAIN ADJUSTMENT LONGER**

Twenty-five years of research and experience in oil-fired heating have proved beyond doubt to Heil that the pressure-atomizing burner is the all-around most satisfactory means for burning oil. The testimony of thousands of service men bears out Heil's findings.

Pressure-atomizing burners are simpler, easier to adjust, more readily repaired. They hold adjustments far longer, have far fewer parts to get out of alignment, to wear out and cause trouble. Hundreds of thousands of installations stand as evidence. It's a strong, solid story, so get out and tell it—sell pressure!

HEIL Burners Are More Efficient

By any test, Heil Burners extract more heat from the oil. They can be adjusted easily for a high percentage of CO₂, to burn without annoying pulsations, and they *stay adjusted that way*. Heil uses cast iron, not aluminum or stampings, and Heil machines parts to closer tolerances, balances more carefully to assure better operation, greater freedom from trouble. For your entire protection, Heil tests every burner before it leaves the factory.

For your own satisfaction, write The Heil Co., Dept. 8199 today, and get the full story. It will interest you. Do it now, while a few territories are still open. You'll like doing business with a major corporation that remembers how to be human.

THE HEIL CO.

GENERAL OFFICES: 3081 W. MONTANA STREET, MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis.—Hillside, N. J.

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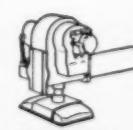
Chicago, Minneapolis, Kansas City, Dallas, Los Angeles, Seattle.



OIL-FIRED
WINTER AIR CONDITIONERS



OIL-FIRED
BOILERS



CONVERSION
OIL BURNERS



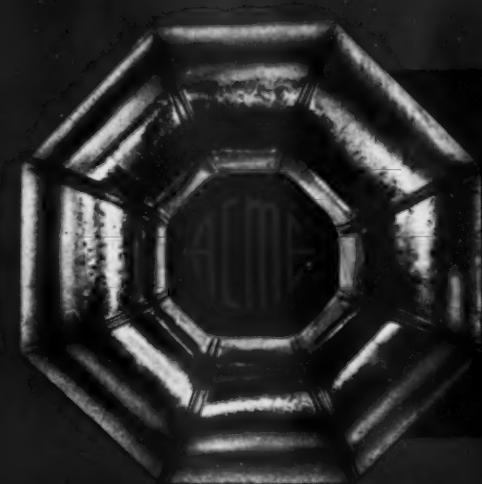
GAS-FIRED
WINTER AIR CONDITIONERS

Manufacturers of Quality Automatic Heating Equipment Since 1924

ACME

FURNACE PIPE, DUCT and FITTINGS

CATALOG
NO. 49



FURNACE PIPE AND GRAVITY FITTINGS . . Pages 2 to 9

DUCT AND FORCED AIR FITTINGS . . Pages 10 to 15

STOVE PIPE, ELBOWS AND FITTINGS . . Pages 16 to 17

SPECIALTIES AND GENERAL INFORMATION . . Pages 18 to 24

ACME MANUFACTURING CO.

Sheet Metal Fabricators

PHILADELPHIA 36, PENNSYLVANIA

MEMO

*Write today for
Acme's new catalog,
and name of the
nearest jobber.*

C

THE 1949 HEATING SEASON IS HERE



GAS-COAL-OIL WARM AIR FURNACES AND AIR CONDITIONING UNITS

USE ONLY GENUINE WISE REPAIR PARTS FOR ALL
WISE FURNACES.

FOR PROMPT SERVICE ORDER DIRECT FROM FACTORY.

THE WISE FURNACE CO., AKRON, O.

PERFEX TWIN CONTACT LIMIT CONTROLS



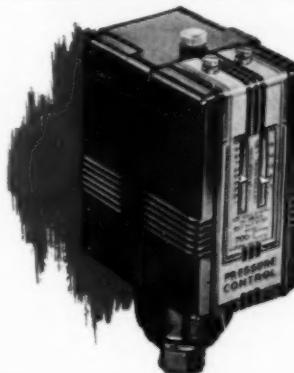
SERIES 405

for Warm Air
Limit Control



SERIES 500D

for hot water
systems and
unit heaters



SERIES 700D

for Pressure,
Vapor and
Vacuum
Application

Dealers Who Want the
Best Ask For

EASY TO INSTALL
LESS SERVICE
COMPLETE SAFETY



You'll save time and money...
You'll serve your customers better...
with these dependable, sensitive
Perfex Limit Controls.

Installation's a breeze because these controls have ample wiring space, simple two-wire circuit and don't need leveling. Less service is required because the dependable twin contact switch has positive magnetic snap action. These features save you money, give greater customer satisfaction and safety.

Specify Perfex Twin Contact Limit Controls on new equipment and for replacement. Write for name of service distributor nearest you.

PERFEX
TWIN CONTACT CONTROLS

PERFEX CORPORATION, MILWAUKEE, WISCONSIN • In Canada, Perfex Controls Ltd., Toronto 1, Ont.

A COMPLETE LINE OF TWIN CONTACT CONTROLS FOR ALL FUELS . . . FOR ALL TYPES OF HEATING

NEW LITERATURE

Use Coupon on Page 109

Safety Device Catalog 301

Everything in Safety is the title of a complete catalog of personal protective equipment and industrial safety devices. The catalog is divided into five sections: First Aid; Respiratory Protection; Eye Protection; Hats, Belts, and Clothing; and Miscellaneous Safety Equipment.

Requests for catalog must be made direct to the manufacturer on company letterhead.

E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif.

Acorn Pushnuts 302

Acorn pushnuts for $\frac{1}{4}$ in. unthreaded rod are illustrated and described on catalog sheet now available. They are recommended as economical for use on assembly jobs where a decorative push-on type nut is desired for permanent application.

The Palnut Company, Irvington 11, N. J.

Wood-Burning Furnace 303

The Woodomat, a furnace especially designed to burn all kinds of fuel wood, is said to give steady, even heat, up to 100,000 Btu/h if desired. It is available in

three models—pipeless or gravity furnace, and space heater.

A four page folder describing the unit lists the advantages of constant heat with thermostatic control, elimination of fuel waste, noiseless and vibrationless operation, and economy of installation. The literature contains a keyed drawing of the unit and explains the principle of combustion employed. Table of specifications and measurements of all models is included.

Pantex Mfg. Corp., Heating Div., Pawtucket, R. I.

Combustion Chamber Catalog 304

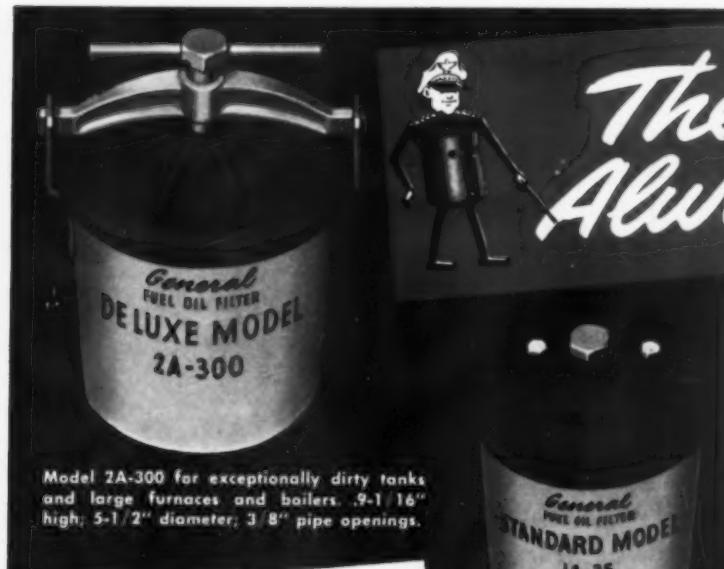
A 12-page illustrated catalog is devoted exclusively to a line of pre-cast combustion chambers. In addition to pictures and specifications of the units, the catalog includes valuable information for jobber and installer on correct sizes, methods of installation, and general importance of combustion chambers in domestic oil heating plants.

Monogram Products Co., Philadelphia 4, Pa.

Copper and Brass Buying Guide 305

Copper and Brass Buying Guide No. 2 is designed for convenience and speed in use, listing on one side of an $8\frac{1}{2} \times 11$ in. sheet complete size range, tempers, Rockwells, tensile strengths, machinability, and ASTM specifications covering almost 2,000 shapes and kinds of copper and brass sheet, tube, bar, rod, wire, and pipe. It is tabulated and indexed in column form.

Central Steel & Wire Co., P. O. Box 5310-A, Chicago 80, Ill.



Model 2A-300 for exceptionally dirty tanks and large furnaces and boilers. 9-1/16" high; 5-1/2" diameter; 3/8" pipe openings.

FOR YOUR PASSENGER CAR OR TRUCK

General Filters are now available for your car or truck. Cartridges changed in one minute without tools. Complete kits include brackets for either engine or dash mounting. Put one on your car and truck. Regular dealer discounts.

Model 1A-25 for space heaters, hot water heaters and small furnaces. 4-3/4" high; 3-1/2" diameter. Same style but with double capacity available as Model 2A-700.

GENERAL FUEL OIL

FILTER

1240 WESTWOOD AVE.
DETROIT 22, MICHIGAN

The Customer Always Returns

You can be sure of repeaters when you sell a General Filter because the customer is always pleased with his money saving investment. So pleased, that it is natural for him to return year after year for a new cartridge. And your profit doesn't stop at the initial sale; it goes on and on with only a minimum of service from you.

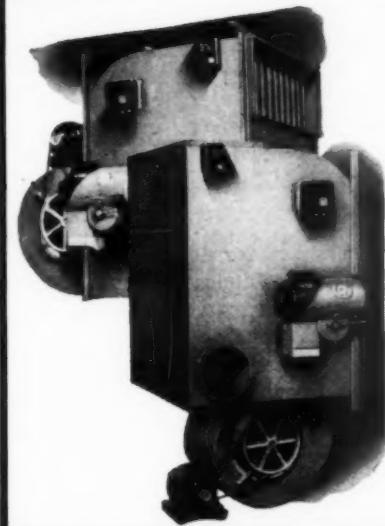
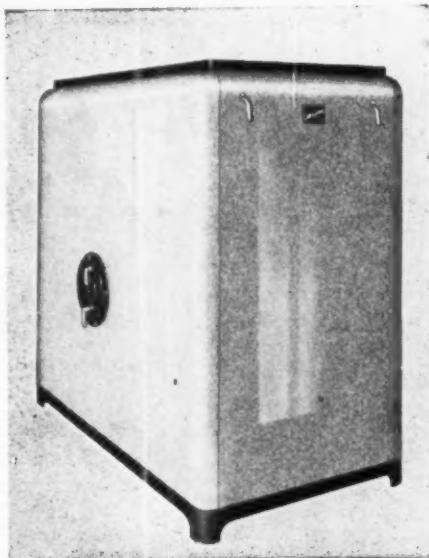
A General Filter on every fuel oil burning installation is a good deal for both you and your customer—you make a nice profit on every sale and your customer is saved annoyance and expense from clogged burners.

**MORE THAN 1600 JOBBERS
TO SERVE YOU**



**DOMESTIC AND
INDUSTRIAL
HEATING
UNITS**

**EASIER SALES AND
MORE SATISFIED
CUSTOMERS**



The variety of models to suit practically every heating purpose makes QUICK HEAT a recognized profit builder for warm air heating dealers. Practical application of sound engineering principles combined with extensive experience has produced this highly recognized line of superior equipment. Performance and convenience of these units proves business building quality to dealers handling this line.

**Overhead Units For
Ceiling or Wall Mounts**

Dealers:

WRITE FOR
DESCRIPTIVE
LITERATURE

READY FOR INSTALLATION

Floor units are mounted on legs to prevent rusting of bottoms and eliminate air leaks. Factory assembled in attractive casing with new type heat saver and specially designed gun type oil burner. Convenient and quick installation.

TJERNLUND MFG. CO.

2140 Kasota Ave.

St. Paul 8, Minn.

The NEW

Brundage BLOWER

You will like this blower for its new high in performance, for its new sturdiness, for its unbelievable quietness of operation. You will like the new improved wheel and the new "H" frame which affords greater strength and reduces vibration. Every desirable feature is incorporated in this new "blower that shows up best in every test."

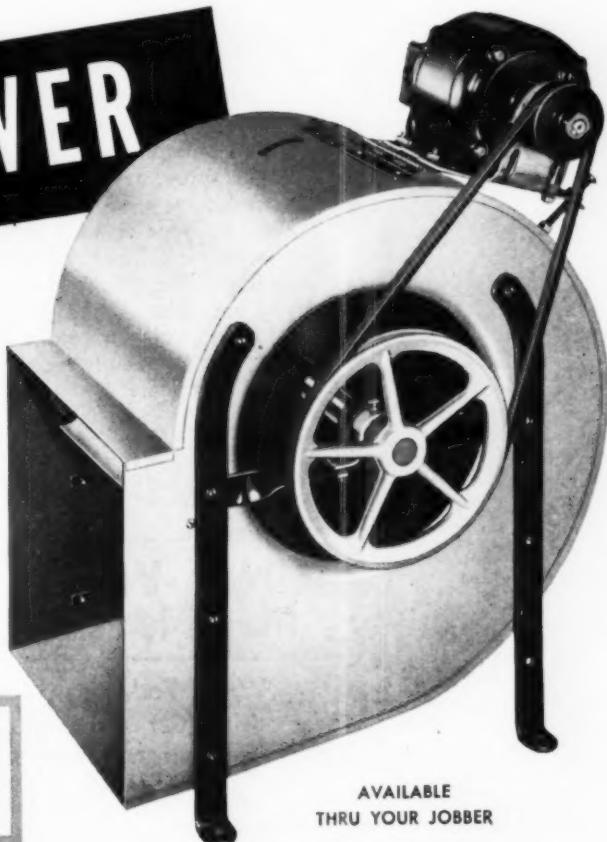
WRITE FOR LITERATURE



Blower Specialists

- Since 1919

613 NORTH PARK STREET
KALAMAZOO 11, MICHIGAN



AVAILABLE
THRU YOUR JOBBER

NOW . . .
a TRULY Forced Air
INN-A-WALL



75,000
Input



. . . and you can employ duct work where necessary!

Yes, sir . . . here is the answer to heating properly small homes without basements. Security's INN-A-WALL is an entirely new principle in forced air heating! Requires minimum duct work . . . may be used without ducts. Needs only 16 by 20-inch floor area.

The INN-A-WALL reverses the usual flow pattern . . . warm air comes out the bottom. This means warm floors! Warm air can be taken from all four sides . . . return air, from all sides at the top. Where ducts are required for distant rooms, permanent connection is made at the bottom. Completely assembled . . . ready to install. Casing height, 88 inches. Security breather tube automatically supplies air for combustion.

Other outstanding INN-A-WALL values are • Quiet, positive blower • Fully automatic • Special Security high-efficiency burners • Complete adaptability to any floor plan (may be placed in wall or stand alone) • Amazingly economical in price.

SECURITY
Automatic, Gas-Fired
INN-A-WALL
FURNACE

Write Today . . .

don't delay. Get all the facts about this revolutionary new furnace.

SECURITY MANUFACTURING CO.

1630 Oakland St.

Kansas City 3, Mo.

NEW LITERATURE

Use Coupon on Page 109

Data Sheet on Fluxes 306

Technical service data sheet is available on soldering fluxes for use in soldering of sheet metal and other products of carbon and stainless steels, brass, copper, tin, terne plate, zinc, and galvanized iron.

Recommended applications for three liquid fluxes, Flosol Nos. 1, 2, and 3, as well as for cream and paste Flosol are clearly outlined. The fluxes in cream and paste form are especially useful in soldering vertical surfaces, or on jobs where the flux is to be applied some time before the soldering is to be started.

American Chemical Paint Co., Ambler, Pa.

Electric Motor Bulletin 307

Developments in electric motor design are discussed in a bulletin featuring the Uniclosed motor. Special construction features are illustrated by color photographs and progressive drawings.

Among the features treated are the asbestos-protected windings, dripproof housing, cyclone ventilation, centri-cast rotor, and annealed laminations. Temperature rise in motors and its effect on windings are discussed at length in the bulletin.

U. S. Electrical Motors, Inc., Los Angeles 54, Calif.

Sheet Metal Tools 308

Booklet No. 200-G contains illustrations, specifications, and descriptions of metal working tools essential to every sheet metal shop. Machines discussed include folders and brakes, hand and power rotary machines, beaders, crimpers, groovers, slip roll formers, squaring shears, and hand and bench tools.

Niagara Machine & Tool Works, 637-697 Northland Ave., Buffalo 11, N. Y.

Insulation Sample Booklet 309

Sample booklet of asbestos-protected Dux-Sulation showing both $\frac{1}{2}$ and 1 in. sizes, is now available. The booklet is designed to be helpful to architects, contractors, jobbers, and engineers when planning or bidding for a job.

Dux-Sulation has a K factor of .27 Btu and is said to be an excellent insulation for all types of warm air heating, air conditioning, and ventilating ductwork.

Grant Wilson, Inc., 22nd Floor, Board of Trade Bldg., Chicago 4, Ill.

Coal Fired Furnaces 310

According to catalog sheets now available, Penn-Aire coal fired furnaces, both gravity and forced air models, are being produced in 16 and 22 in. sizes, as well as in the 18 and 20 in. models previously offered.

The 16 in. forced air furnace, with capacity of 45,000 Btu, is designed especially for small home installations.

Union Manufacturing Co., Inc., Boyertown, Pa.

Equip with **THERMO DRIP**

**FOOL PROOF
AUTOMATIC HUMIDIFIER
THAT LASTS LONGER**

Thermo-Drip Humidifiers are made to give you years of trouble-free performance. Even with hardest water, Thermo-Drip stands the test with long life and few replacements.

Thermo-Drip pans are stainless steel, rust-resistant, corrosion-proof. This thin bare metal pan with only a thin film of water gives greater humidifying efficiency by heating and vaporizing the water much faster.

Thermo-Drip Humidifiers are the adjustable humidifier. An outside fingertip control gives every user precisely the amount of humidity desired.



These extra features are built into every Thermo-Drip Humidifier

- Drip Feed Principle creates balanced atmosphere
- Hot pan surface gives immediate vaporization.
- No stagnant pool of water stands in pan
- Fingertip adjustment for more or less humidity
- Easy to clean
- Valve movements prevent clogging by lime
- Easy to install — fits all types of warm air furnaces

Write today for Free Catalog, Dept. A-99

**AUTOMATIC HUMIDIFIER CO.
CEDAR FALLS, IOWA**

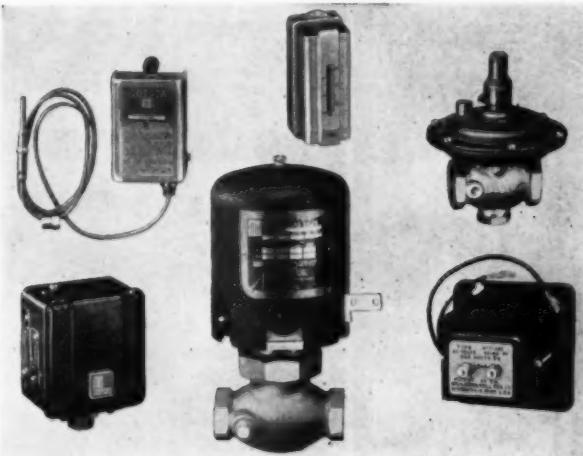
Barber Conversion Burners are Equipped with the BEST Automatic Controls



Latest design Barber 324-B round Conversion Burner with improved controls, enclosed in streamlined hood. Tested and certified by AGA Laboratory under new 1949 listing requirements.

Besides having unexcelled combustion principles, due to patented Barber impinged vacuum feed jets, and direct scrubbing flame application to fire-box, Barber Gas Conversion Burners also have another important feature. They incorporate the highest grade automatic controls and safety devices available. Barber Burners are made in many sizes for all round or oblong furnaces and boilers. When recommending or installing gas conversion equipment, use Barber units for top performance and economy of operation.

Write for latest Catalog illustrating and listing many types of Burners for Appliances, Gas Conversion Burners, Regulators, and Controls.



Note the high quality type of automatic controls used with Barber Conversion Burners — the finest precision equipment obtainable.

**THE BARBER GAS BURNER CO.
3704 Superior Ave., Cleveland 14, Ohio**

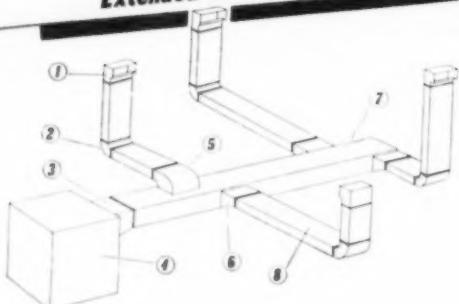
BARBER

Automatic
Jet Gas

BURNERS

SAVE UP TO 25%
ON LABOR

with this
Extended Plenum System



1. 2F STACKHEAD
2. WALLSTACK ELBOW 90° SHORTWAY, No. 16
3. OFFSET STARTING COLLAR
4. PLENUM CHAMBER
5. EXTENDED PLENUM TOP TAKE OFF No. 43
6. EXTENDED PLENUM TAKE OFF No. 44
7. EXTENDED PLENUM
8. STANDARD WALL STACK

This simple, streamlined system, for use on residences of normal size, can be installed faster, with greater accuracy and fewer costly man hours . . . which all adds up to more profits for you. It permits you to meet a competitive market with assurance of benefit to both yourself and your customers.

A simple way to determine size of trunk line on this type of job, when used on residences which do not have unusual features, is to use a trunk line 8 inches high, the width being 2 inches plus 2 inches per branch. Thus, the illustration shows 4 branches, so the trunk line should be 2 plus (4 x 2) or 10 inches wide by 8 inches high.

To save time, to simplify planning, specify Ohio Valley and take advantage of their years of specialized experience.

Ask your distributor for details, and write us for Free Illustrated Price Catalog.



Metal Manufacturing Division of
OHIO VALLEY
HARDWARE & ROOFING COMPANY
Evansville 2, Indiana

NEW LITERATURE

Use Coupon on Page 109

Humidity and Air Purification Brochure . . . 311

The problem of imparting to winter heated and summer cooled air the desirable qualities of fresh outdoor air is thoroughly treated in a brochure on an air conditioning unit called the Air-Renewer.

Stressing the importance of humidity and of clean air in relation to human health and comfort, the booklet explains the use of triethylene-glycol for humidity conditioning in the home. The bactericidal effects of glycol vapors and the efficacy of ultra-violet germicidal lamps in the conditioning system are discussed in readily understandable terms.

The functions of the Air-Renewer, procedure for its installation, and the noteworthy scientific progress which this unit represents in the field of *Indoor Comfort* are treated in the latter pages of the brochure.

Brundage Co., Kalamazoo, Mich.

Electrode Bulletin 312

Mild steel electrodes are discussed in Bulletin 462, entitled Weldirectory for Mild Steel and Low-Alloy High-Tensile Steels. The bulletin contains, in addition to a guide for selection of electrodes, information on shielded arc welding. Following pages are devoted to data on numerous types of shielded arc electrodes, listing for each type the application, physical properties, procedure for use, and typical applications.

The Lincoln Electric Co., Cleveland 1, Ohio.

Oil-Gas Burner 313

Literature is available on the Combi-Matic burner which is said to furnish economical and dependable heat when used with either oil or gas. A keyed diagram illustrates the construction features of the burner, and mechanical specifications, as well as sizes and specifications for all models, are included.

Siemon and Co., 3025 Main St., Kansas City, Mo.

Corrosion Resistant Steel 314

Corrosion resisting sheet and plate, known as Durimet 20, is recommended by architects and engineers for fabrication of ducts handling corrosive fumes. Advantages of this material, in addition to its corrosion qualities, include ease of fabrication, and its lightness and strength.

Durimet 20 is a special, low carbon austenitic stainless steel alloyed so that it possesses a corrosion resistance superior to that of 18-8 stainless steels, yet retains approximately the same working characteristics.

Literature available on this special sheet steel includes a list of common corrosives to which the sheet is resistant, illustrations of existing installations, and a table of standard gauges, sizes, weights, and finishes.

One page is devoted to size and capacity data on three types of corrosion resistant fans which are supplied in three different alloys.

The Duriron Co., Inc., Dayton 1, Ohio.



Round Cased
A. C. Steel Furnace



Oil-Fired Winter
Air-Conditioning Unit



High Efficiency
Oil Burner



Homer Outdoor
Garden Grill



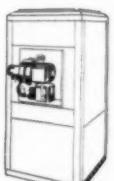
Blower
Package Unit



Improved
Pipeless Furnace



Square Cased
Steel Furnace



Oil-Fired Winter
Air-Conditioning Unit



Gas-Fired Winter
Air-Conditioning Unit

Extra Profits WITH HOMER

Homer's new line of oil, gas and coal furnaces places our dealers in an enviable position in meeting all heating requirements. Not only in efficiency and materials, but in prices, too.

Our fine new line gives the dealer a wide variance in sizes: running from 75,000 to 400,000 BTU's; and in addition to furnaces, Homer can supply other kindred heating equipment . . . such as blowers, conversion oil burners, filters, controls, repairs, etc.

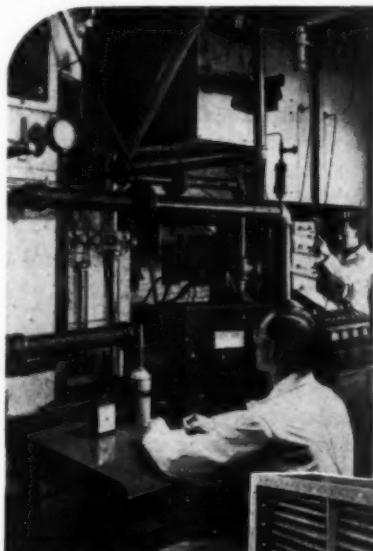
Homer Agencies build Profits!

We invite inquiries from responsible manufacturers' representatives.

Homer Furnace & Foundry Corp.

COLDWATER, MICHIGAN

*"What's home
without a Homer"*



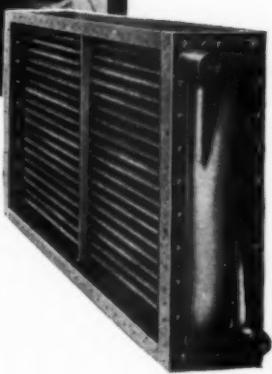
ACCURACY • EFFICIENCY • DEPENDABILITY

AEROFIN

Fin-Type Heat Exchangers

You get all three — accuracy, efficiency and dependability — when you install Aerofin heat-transfer surface. Continuous research has led to the development of extremely accurate ratings — you can install to full capacity with complete confidence. And Aerofin's unequalled experience and facilities in the exclusive manufacture of fin-type surface for 26 years assure you of dependability and maximum efficiency.

Aerofin staff engineers are well qualified and quickly available to assist you.



Aerofin heat-transfer surface is available in a complete range of sizes, designs and materials for heating and cooling application. Write for information.

AEROFIN CORPORATION

410 South Geddes St., Syracuse 1, N. Y.

NEW YORK • CHICAGO • CLEVELAND • DETROIT
PHILADELPHIA • DALLAS • SAN FRANCISCO • MONTREAL

AEROFIN is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

HANDY PIPE

has meant

**Quicker Handling,
Faster Installations,
Greater Real Profits
and more Customer
Satisfaction ever since
it became the Nation's
standard pipe in 1894.**

**Its design and con-
struction still lead the
industry.**

**Extended Plenum fit-
tings, are now part of
the HANDY PIPE line
and orders are filled
promptly.**

**F. MEYER &
BRO. CO.
PEORIA, ILLINOIS**

WITH THE CONTRACTORS

THE NAROWETZ HEATING AND VENTILATING COMPANY, Chicago, entertained 685 employees and their families at the annual company picnic held this year at Fox River Grove on July 30.

Among the guests were Robert Byron, president of the Sheet Metal Workers' International Association, and Joseph Kaberlein of the Chicago local.

Races and contests were arranged for both adults and children. An event that proved most interesting to the crowd was a contest in which 12 teams competed in putting together a prepared 8 by 8 in. square elbow with Pittsburgh locks. The first fitting was completed in 2½ minutes, but speed and neatness were considered in judging the contest. First place award went to Bud Davidson.

Arrangements committee for the outing consisted of Larry Bain, Jim Mraz, Art Narowetz, Harry Brinker, Stuart Anderson, Bud Anderson, Jerry Hermann, Bob Davis, Clarence Dietelhoff, and Larry Paul, vice president of the company, who took charge of announcing events.

EL ROY PAYNE, owner of the E. L. Payne Heating Co., 9242 Beverly Blvd., Beverly Hills, Calif., has recently formed the Beverly Heating Supply Co., a wholesale firm which will operate from the same address.

THE SAN PEDRO SHEET METAL WORKS, owned by M. J. Herrold, has moved into a new one-story brick building with a modern plate glass and stainless steel front. The new location is 662 "R" St., Fresno, Calif. The present plant provides approximately twice the floor space of the old location at 457 Broadway, and has a 50 ft frontage on "R" St., and a depth of 75 ft. Other advantages are a large parking area and an adequate storage yard.

Mr. Herrold's company manufactures in sheet metal and handles heating and air conditioning equipment as well as building materials.

THE LONG SHEET METAL WORKS at 711 South Dudley St., Memphis, Tenn., headed by J. B. Long, is being kept busy installing heating, ventilating, and air conditioning equipment, as well as roofing and gutter work.

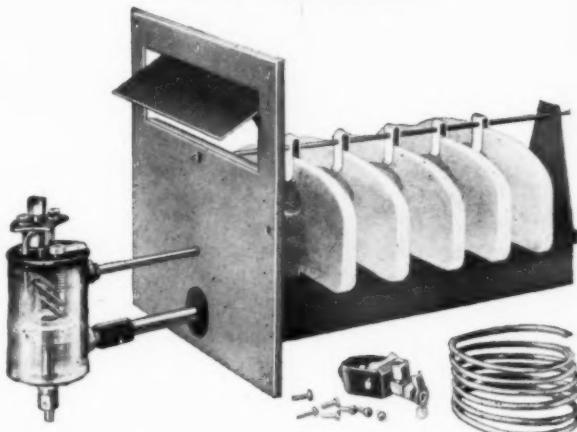
Jobs recently completed by the company include installation of air conditioning and sheet metal work in a delicatessen; metal work for a department store; heating and gutter installations for two construction companies; and blow pipe work for a cotton gin and delinting plant.

A. M. Finckh

A. M. Finckh, president and treasurer of the National Cornice Company, Lima, Ohio, died on July 24th at the age of 79 years, 11 months.

Mr. Finckh has been identified with the sheet metal and roofing industry in Lima since 1902, and was active in the business until the time of his death.

IT'S HERE!
 The Small Humidifier You
 Have Been Waiting For!
THE NEW
MONMOUTH FLOTROL
"310 SERIES"



● MONMOUTH has for many years been the TOP name for dependability in humidifiers. Experts recognize that it is engineered and built on better operational principles than most humidifiers. Now Monmouth offers you a new model that will certainly meet price competition on your smaller jobs, a companion product to our standard FLOTROL and MICRO-FEED.

● The "310" is designed especially for modern smaller furnaces and air conditioning units, up to 100,000 BTU capacity. Monmouth ceramic diffusion plates (new style). Heavy copper pan. Shipped completely assembled—a 1-package product, nothing to put together, nothing else to buy. Quickly installed from outside the furnace. All you need to do is cut your hole, make water connections, attach access plate (containing combination inspection door and plenum register) to plenum and level the pan with adjusting screw from the front. Register has pivot shut-off valve and equals an 8" x 4" register in free area. The whole front access plate is hinged to pan and fits vertical or slanting plenum.

● Although lower priced than previous Monmouth Humidifiers, this "310 Series" model operates on the long famous and time-tested Monmouth principles, has the same control unit, and is in every respect a true Monmouth quality product—just a smaller edition, that's all.

Why not send for a sample "310" Monmouth Flotrol NOW—and see for yourself that it "clicks" perfectly on small furnace installations? The price will interest you. Full details on request.

THE CLEVELAND HUMIDIFIER CO.
 7802 Wade Park Avenue Cleveland 3, Ohio

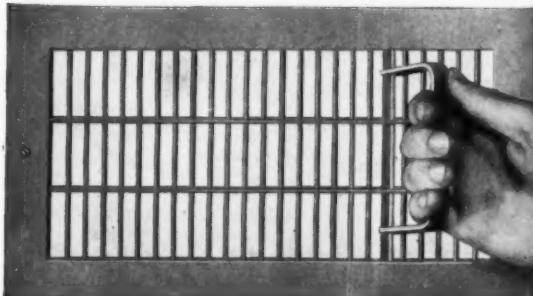
MONMOUTH
HUMIDIFIERS

INDEPENDENT

"Fabrikated" **WALL GRILLES**
 for Commercial Installations

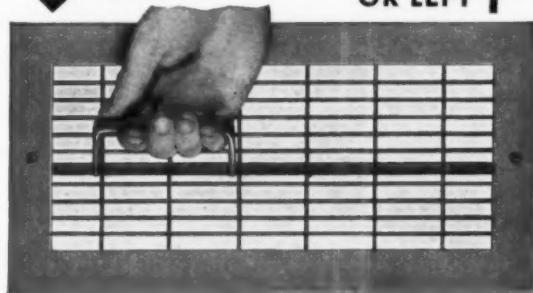
**PROVIDE ADJUSTABLE
 DIRECTED AIR FLOW**

321-A



UP OR
 DOWN

RIGHT
 OR LEFT



311-A

**Made to fit openings in even
 inches from 8" x 4" to 60" x 40"**



Independent Fabrikated* Adjustable Grilles (patented), rigidly constructed with stamped steel rims and steel bars, are made with either vertical or horizontal grille bars. Grille bars are adjustable before or after installation; available also with bars permanently set for straight flow.

Write for new Catalog No. 48—gives schedule of sizes, details and prices.

Always Leading—Always Progressing

*Reg. U. S. Pat. Off.

**THE INDEPENDENT
 REGISTER CO.**

3747 E. 93rd STREET • CLEVELAND, OHIO

It Costs No More to Use the Best



-and it may save plenty!

THARCO is made to meet service conditions far more severe — far beyond — normal warm air furnace operation. That's why you can use it with complete confidence. It's the best insurance in the world of a gas-tight, smoke-tight job — of jobs that bring credit to your foresight and workmanship. No costly complaints, no doing the work twice — with Armstrong's THARCO. Your jobber can supply you, or write us for complete information.

THARCO
*Will not shrink,
check or powder!*

THARCO
*For easier
application!*



THARCO
Asbestos Furnace Cement
THE ARMSTRONG COMPANY
1045 So. LaSalle St. 241 So. Park Ave. 3749 So. Crowley St.
CHICAGO DETROIT DALLAS

SALES SENSE

By JACK BEDFORD

Fall is harvest time for salesmen as well as for farmers . . . gather those ripe sales now that have grown from the prospecting seeds planted during the spring and summer months.

Don't be like the old maid who knew all the answers, but who was never asked the question . . . make more calls.

Quality products are built up to a standard—not down to a price.

Don't talk price. . . . Sell quality.

Francis Bacon said: "Age appears to be the best in four things—old wood best to burn, old wine best to drink, old friends best to trust, and old authors best to read." Add one more for modern selling—Old customers best to depend on when competition is tough.

Even if you are on the right track you will be run over if you just sit there.

Every thumb print is different so is it any wonder no two customers react the same way to a sales story. Fit the sales story to each customer.

Emerson said: "Manners require time, as nothing is more vulgar than haste."

Heard about the salesman who was transferred when his wife had triplets? Now he is in the production department.

Yesterday is a cancelled check; tomorrow is a promissory note; today is ready cash . . . spend it wisely.

Counterfeitors during the time of the Spanish Conquest of South America made platinum coins, plated them with gold, and passed them off as gold even though gold is 100 times more plentiful than platinum. Are you gold plating your platinum selling opportunities?

If you know how to use your spare time you seldom have any to spare.

Remember when you point your finger accusingly at someone you have three fingers pointing at yourself.

Sales Sense is common sense with a college education.

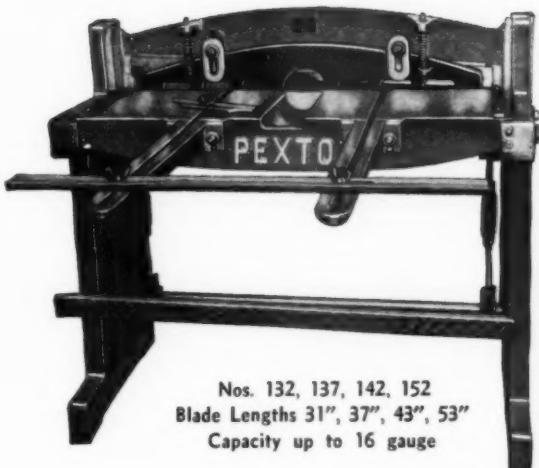
Salesman: I've been trying to see you all week.

When may I have an appointment?

Buyer: Make a date with my secretary!

Salesman: I did, and we had a swell time. But I still want to see you.

PEXTO SQUARING SHEARS..



**ACCURATE, LOW COST
HIGH CAPACITY**

Six important features make this PEXTO Shear the finest obtainable for either small shop or production department.

1. Adjustable Treadle Pin . . . upper hole for normal shop operations . . . lower hole for increased capacity—up to 16 ga.
2. Precision Back Gauge.
3. Adjustable, graduated Side Gauges.
4. Unbreakable steel Treadle.
5. Latest safety coloring.
6. Enclosed Compression Springs.

Specify Dependable PEXTO

THE PECK, STOW & WILCOX COMPANY
Since 1785
SOUTHBURY, CONNECTICUT, U.S.A.

3PX49

COMPETITION IS TOUGHER-

Now is the Time to Get in On a Good Deal!

Brandes offers you a quality product at a price that will get you Volume Business



GH-75-10
75,000-100,000
B.T.U. HI-BOY



GH-10-12
100,000 to 120,000
B.T.U. HI-BOY



GH-12-15
120,000 to 150,000
B.T.U. Hi-Boy



G-75-10
75,000-100,000
B.T.U.

Twenty-five years' Heating Experience puts us in a position to know what you want in a product.

We build you a Quality Business.

BRANDES COMPANY—MADISON 4, WISCONSIN



G-10-12
100,000 to 120,000
B.T.U.



G-12-15
120,000 to 150,000
B.T.U.



G-16-20
160,000 to 200,000
B.T.U.

WE OFFER

- A QUALITY UNIT
- COMPLETE RANGE OF MODELS AND SIZES FOR THE CONSUMER MASS MARKET

AN EXCEPTIONAL DEAL FOR PROPER DEALERS

JOHN ZINK CONVERSION BURNERS

Available In Two Models



Luminous
Flame Model
Illustrated

LUMINOUS FLAME MODEL

Easy to install. Operates manually or automatically. Burns clean fuel—natural, mixed, manufactured or LP gases—without soot or smoke. Luminous flame radiates heat two to three times faster than a blue flame. Four sizes available for either vertical or horizontal firing.

BLUE FLAME MODEL

Designed to meet the requirements of this type of burner. Capacity range of 100,000 to 200,000 Btu/hr. for operation on natural, mixed or manufactured gases. Manual or automatic operation. Easy to install.

The Amazing New AUTOMATIC WATER HEATER

Another New
John Zink
Quality Product



SIZES, RATINGS, RECOVERY CAPACITIES

For Natural, Mfd. and Liquified Petroleum Gases				
No.	Cap. Gal.	Input Rating Btu per Hr.	Recovery Gal. per Hr.	Crated Weight
X-20	20	20,000	28.0	150
X-30	30	23,000	32.1	190

Gas Conn. $\frac{3}{8}$ ". Water Conn. $\frac{3}{4}$ ". Flue Conn. 3". Recovery capacities based on 60° temperature rise.

Write for Literature

John Zink Company
4401 SOUTH PEORIA
TULSA, OKLAHOMA

New York — Salt Lake City — Houston — Los Angeles

INDUSTRY ITEMS

THE APPOINTMENT OF R. J. CLARK of Clearwater, Florida, as manufacturer's representative for Nu-Way products in Florida and southern Georgia, was announced by O. K. Gipple, sales manager of the Nu-Way Corporation, Rock Island, Illinois.

Mr. Clark is the head of the R. J. Clark Equipment Company, Inc., with headquarters in Clearwater, Florida.



R. J. Clark



Earl L. Wiseman

PLASTEEL PRODUCTS COMPANY, Washington, Pennsylvania, has announced the appointment of Earl L. Wiseman as general sales manager of the company.

Under Mr. Wiseman's direction the company is carrying forward its policy of establishing leading steel fabricators and steel warehouses as distributors of Plasteel Products. In this way Plasteel will be made available through local stocks for prompt delivery on maintenance jobs and new construction.

Mr. Wiseman is well known in the steel field as the designer of many heavy duty ventilating jobs, such as the Open Hearth Building at the Kaiser Fontana, California Plant.

PARKER MANUFACTURING COMPANY, Worcester, Massachusetts, has announced the acquisition of Ackermann-Steffan Company, Chicago, Illinois manufacturer of hack saw blades and equipment.

The Chicago firm will be known as the Ackermann-Steffan Division of Parker Mfg. Co., and will continue to manufacture the same group of products at the present plant, 4532 Palmer Street.

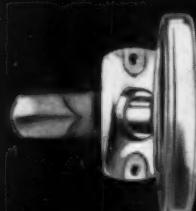
CATSKILL METAL WORKS, INC., of Catskill, New York, has announced the appointment of Norman A. Picard, Holbrook, Massachusetts, as its representative for the New England states. Mr. Picard will handle Catskill oil burners and anthracite stokers.

Russell W. Mitchell

Russell W. Mitchell, a partner in the Banner Heating Company and Banner Repair Parts Company, Youngstown, Ohio, died suddenly of a heart attack on Saturday, August 6, 1949.

Mr. Mitchell was well known in the heating industry in his area as he had been a member of the above firms since 1928. He was also a member of the board of directors of the Mahoning Valley Sheet Metal Association.

make *National Lock*
your "1-Source"
hardware supplier



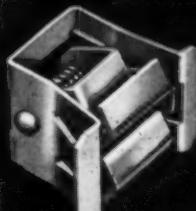
61-366 HANDLE



61-270 CATCH



RECESSED HEAD
SHEET METAL SCREW



61-340 CATCH



STOVE BOLT

write us for
full information

NATIONAL LOCK COMPANY
Rockford • Illinois

and take
advantage of...

- simplified purchasing
- complete selection
- simplified control
- lower shipping costs
- uniform high quality
- prompt delivery



all these dependable
National Lock items
are ideal for use on:

- space heating units
- air conditioning equipment
- oil burners
- stokers
- gas heating units
- humidifiers

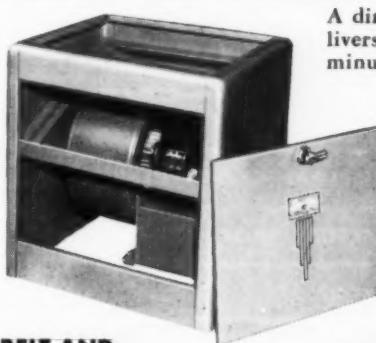
You get → **COMPLETENESS
AND
DEPENDABILITY
WITH
Profit**

IN Peerless Electric PACKAGE UNITS AND BLOWERS

• Peerless Electric blowers and package units are manufactured *complete* in the Peerless plant. Peerless is *not* an assembled line.

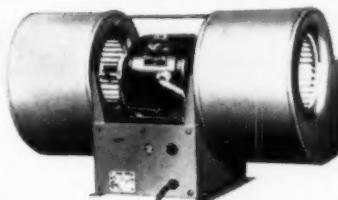
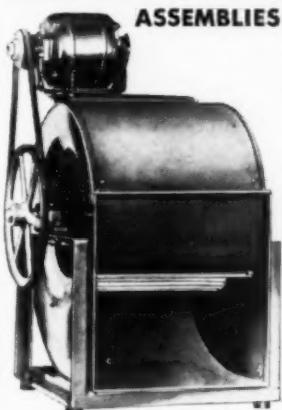
Peerless equipment is *dependable*—you minimize service worries because Peerless equipment is designed and engineered from 56 years experience in producing quality electrical apparatus. And you'll find that Peerless blowers and package units are priced right to earn a profit for you. Write for detailed information.

PEERLESS ELECTRIC AIRBOY BLOWER ASSEMBLY



A direct drive blower that delivers 850 cubic feet of air per minute. 3-speed blower with motor blower unit rubber cushioned. Blower wheel dynamically and statically balanced. The two motor bearings are the only bearings in the unit. Also supplied with cabinet and air filters as a complete package unit.

BELT AND DIRECT DRIVE BLOWER ASSEMBLIES



You'll find Peerless blower assemblies in many nationally-sold air conditioning furnaces of the finest quality. We furnish both of these assemblies ready to install in your own furnaces or cabinets. The many fine construction qualities of these blowers add valuable sales features to your heating units.

THE PEERLESS ELECTRIC COMPANY
ESTABLISHED 1893 • WARREN, OHIO

Peerless Electric
MOTORS • FANS • BLOWERS

BARBER
COLMAN

DOUBLE DEFLECTION



uni-flo GRILLES

LOOK AT THESE FEATURES

★ RAPID DIFFUSION

★ HIGH ASPIRATION EFFICIENCY

★ MAXIMUM TEMPERATURE DIFFERENTIAL

★ MINIMUM PRESSURE DROP

★ REMOVABLE CORE

★ GUARANTEED PERFORMANCE

WRITE FOR THIS LITERATURE

BULLETIN F-3717

The outstanding feature of these new UNI-FLO Grilles is the arrangement for adjusting the vertical fins after installation so as to obtain the desired degree and pattern of horizontal spread on the air stream. In addition, by suitable positioning of the removable core, vertical direction of the air stream is controllable within a substantial range. Hence — DOUBLE deflection control is obtainable.

BARBER-COLMAN COMPANY
1326 ROCK STREET, ROCKFORD, ILLINOIS

THE PACIFIC COAST acquired an addition to its growing roster of new industries with the start of operations at the \$7 million Owens-Corning Fiberglas Corporation plant which has been under construction since early 1948. With an initial group of 275 factory and office employees, the plant is now turning out Fiberglas building and industrial insulation materials, and within a short time will be producing cold storage and aircraft insulation. At a later date it is planned to install additional equipment for the production of shipboard insulation, duct insulation, and acoustical tile.

Fiberglas products manufactured in the Santa Clara plant will be marketed in all the states west of the Rocky Mountains. For a number of years Owens-Corning Fiberglas Corporation has had branch sales offices located in Seattle, Portland, San Francisco and Los Angeles. To provide for new manufacturing and expanded sales activities in the Pacific Coast territory the Fiberglas Corporation last fall established a separate Pacific Coast Division under the direction of L. R. Kessler, a vice president of the company. Sub-branch sales offices have now been established in Spokane, Washington; Eugene, Oregon; Sacramento, Fresno and San Jose, California; Phoenix, Arizona; Albuquerque, New Mexico; and Salt Lake City, Utah.

The new plant consists of the main factory, administration building, warehouse, boiler house, asphalt house, batch materials storage building, binder mix building, fire protection building and well pump house. These nine buildings place under roof a total area of 346,000 sq ft, nearly eight acres.

MAURICE H. THOMAS, formerly associated with the Plumbing Supply Company in Evansville, Indiana, has joined the sales staff of the L. J. Mueller Furnace Company. He will cover parts of the states of Indiana, Ohio, West Virginia, and Kentucky.

A registered professional engineer in the state of Kentucky, Mr. Thomas was an engineer on mechanical ventilation of U. S. Navy ships during the war. His sales experience in the heating equipment field dates back to 1933, during which time he has become familiar with all leading lines of heating and air conditioning equipment.



M. H. Thomas



Dow Warren

BUIE-LUNS福德 COMPANY, Houston, Texas, has been appointed district representative for that area by the Plasteel Products Company, Washington, Pennsylvania. The Plasteel line of permanently protected roofing and siding will increase the ability of Buie-Lunsford to serve its industrial, commercial and farm customers. The company has set up a Plasteel division and Dow Warren has been named sales manager.

• •

**"our NEW A-J wall register has everything
and it's a MONEY SAVER too!"**

• •

- ✓ Easy to install . . . one piece welded assembly.
 - ✓ One piece control handle that is permanently locked-in and welded.
 - ✓ Made from heavy 20 gauge cold rolled steel.
 - ✓ No walls streaks due to felt gaskets & horizontal face louvers.
 - ✓ Available in matching baseboard styles.
 - ✓ Horizontal face louvers available in all standard sizes.
- •



No. 30 single leaf wall register.



**SHEET METAL WORKERS
AND JOBBERS:** Write in for our NEW price list and catalog today.

A-J MANUFACTURING COMPANY
2119 WASHINGTON ST.
Kansas City 8, Missouri

Dept. A

Now Only \$2.00 for This Outstanding Book
on Air Conditioning

The Third Edition of

AIR CONDITIONING FOR COMFORT

by SAMUEL R. LEWIS

288 Pages—6½" x 9¼"—Cloth Bound

Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT.

Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send \$2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning books you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue

Chicago 2, Illinois

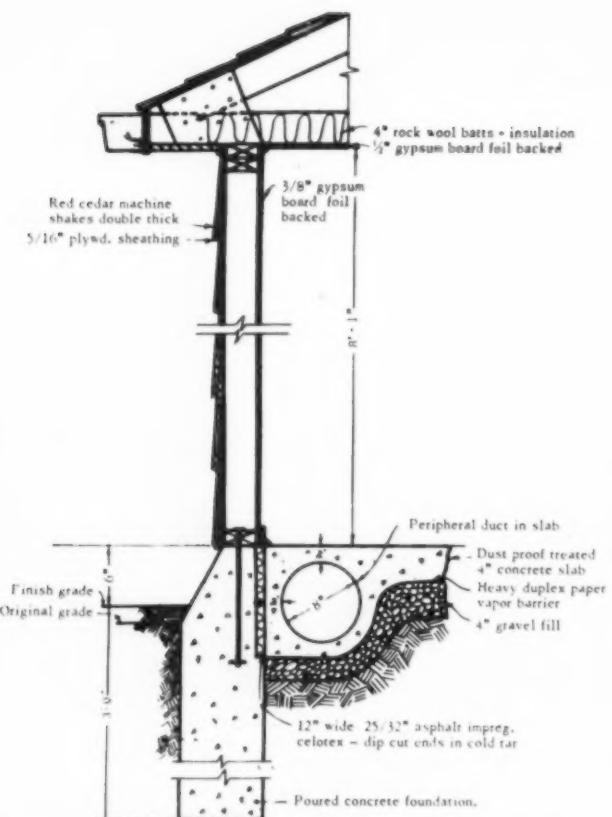


Fig. 3 Construction details of the exterior walls and the manner in which the perimeter duct is installed in the concrete slab.

Third Research Residence—

(From page 86)

There are 2 in. of concrete below the duct and from 2 to 3 in. of gravel below that. Although the association does not recommend using less than 2 in. of edge insulation in a system of this type, where the high temperature source is located near the outside edge, to keep the construction typical of present construction practice the edge insulation consists of 25/32 in. asphalt impregnated celotex board.

The concrete slab is 4 in. thick over a 4 in. gravel fill with a vapor barrier between the gravel and concrete.

Fig. 4 illustrates the manner in which trenches were dug and the ducts suspended in order to allow space for concrete to flow under the ducts. In this illustration the gravel fill is in place and the vapor barrier has been laid with the concrete reinforcements partially in position ready for the concrete. Note that the furnace pit and register locations have been boxed in. It is suggested that register boxes be covered so that concrete will not drop down into the boxes.

Special care must be taken to secure the ducts in their proper position, so they will not float when the concrete is poured.

In research residence No. 3 steel wickets were placed over the ducts and pressed down into the ground. In using similar wickets it is important to determine whether the wickets are sufficiently long to give good anchorage. Another method which has proved satisfactory to keep the ducts from floating is that of attaching a wire to the sill plate above the foundation

Sell the “SILENT”

GIVE YOUR CUSTOMERS THE KEEN BEAUTY AND PERFORMANCE OF A MODERN OIL BURNING AUTOMATIC WINTER AIR CONDITIONING UNIT

Sell the “SILENT”. That’s a sage bit of advice now that competition is getting tougher. It enables you to provide new and replacement prospects with a modern, automatic winter air conditioning unit, skillfully designed to extract maximum heat from the fuel and distribute evenly a clean, healthful flow of properly conditioned air.

You’ll find other jobs easier to get and customer recommendations better when the low economy figures and superlative performance of the “SILENT” are passed along. We’ll be glad to send more information.

CHECK INTO OUR STEEL WELD GRAVITY LINE

For installations where gravity furnaces are desirable you'll find the old, reliable Brenner Steel Weld a sterling performer. It's available in three sizes and easily adaptable to any size home or small business establishment.

PLEASE WRITE TODAY TO . . .

JACOB BRENNER COMPANY
Fond Du Lac, Wis.

ZIP

Through Sheet Metal Work

with Black & Decker
Porto-Shears*

Black & Decker Electric Porto-Shears cut sheet metal too tough for snips, speed up jobs where snips are slow. Fast, powerful shearing action eliminates hard muscular strain. New 12-gage unit has been developed to increase the range of the Porto-Shear line to heavier materials. Over-all design simplicity is retained with heavier construction necessary to shear 12-gage steel. Also shears about two gages thinner in Monel and stainless; 50% above rating in sheet copper, aluminum, lead, etc. Other models include 16- and 18-gage Porto-Shears.

For full information on Porto-Shears and many other speedy Electric Tools, see your nearby B&D Distributor. Write for free catalog to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Maryland.

*Trade Mark Reg. U. S. Pat. Off.

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker
PORTABLE ELECTRIC TOOLS



ELECTRIC DRILLS



SCREW DRIVERS



BENCH GRINDERS



WIRE BRUSHES

HERE'S THE NEW **CHASE** THRU-WALL COPPER FLASHING



Five-feature FLASHING that bonds in every direction!

Chase Thru-Wall Copper Flashing gives you these five outstanding advantages:

1. Its saw-tooth design bonds the masonry laterally and vertically in every direction. A 3-way bond flashing at a reasonable price!
2. It quickly drains any moisture penetrating the wall.
3. It's easily formed by the sheet metal contractor.
4. It comes in 6-foot lengths—economical to install. Interlocking overlap needs no soldering.
5. It's readily available through 23 Chase warehouses and leading distributors.

Chase
the Nation's Headquarters for
BRASS & COPPER

WATERBURY 20, CONNECTICUT
SUBSIDIARY OF KENNECOTT COPPER CORPORATION

WAREHOUSES:	Minneapolis
Baltimore	Newark
Boston	New Orleans
Chicago	New York
Cincinnati	Philadelphia
Cleveland	Pittsburgh
Dallas	Providence
Detroit	St. Louis
Indianapolis	San Francisco
Kansas City, Mo.	Seattle
Los Angeles	Waterbury
Milwaukee	Albany
	Houston
	Rochester
SALES OFFICES:	



Mail coupon for free information
on features and uses.

Chase Brass & Copper Co.
Dept. AA-99, Waterbury 20, Conn.

Gentlemen:

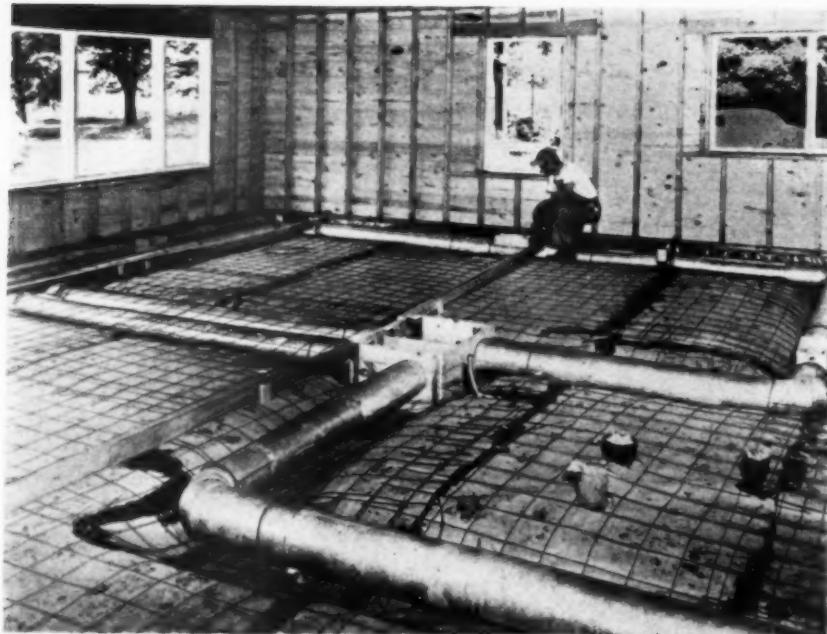
Please send me free descriptive literature on Chase Thru-Wall Copper Flashing.

NAME _____

ADDRESS _____

CITY _____ STATE _____

Fig. 4 This illustrates the installation of the 8 in. round ducts which were laid in the trenches forming the two loops of the perimeter system prior to pouring of concrete. Furnace pit can be seen in center of picture with floor register outlets boxed in around far loop.



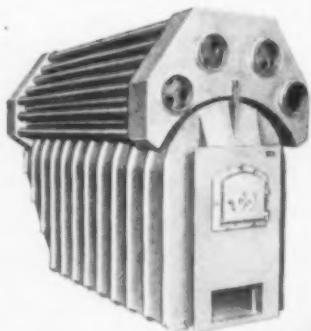
and attaching the other end across the top of the duct to a stake which is driven into the ground at an angle so that it will not be pulled up. After the concrete around the duct has partially set the wire can be snipped.

Precautions should also be taken to guard against denting the ducts when the concrete is being poured, since dents can affect air flow in the ducts to a considerable degree.

The system actually is a split system, with a panel effect produced by the ducts embedded in the slab and the convection effect produced by introducing the air into the rooms. Warm air for the rooms will be supplied by floor registers which are located below windows. Exceptions to this are a 14 by 6 in. baseboard register in the dining area which will be used as an alternate register for testing purposes and a 10 by 6 in. high side wall register in the bath. To test the effect of

NATIONAL CHAMPION

NATIONAL HEATER COAL FIRED



FORCED AIR UNIT

Specifically constructed and designed for stoker and hand firing with blower position at rear or side of casing, this unit embodies all the features of other NATIONAL heaters for greater satisfaction and economy of operation. Can be quickly and efficiently converted to light oil, heavy oil or gas firing as future fuel costs and supplies may necessitate.

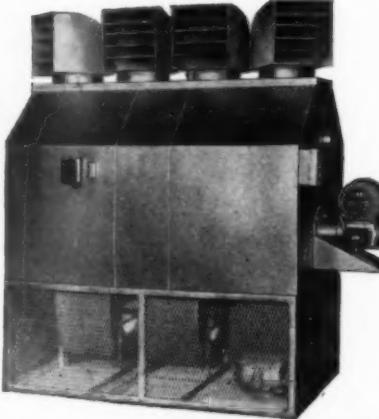
WIDE RANGE OF APPLICATIONS

These units have proven practical and economical for most types of public, commercial and industrial buildings. National Champion heaters are the product of over a half century of experience in this field and the latest advanced engineering features of these units have been tested in a rapidly increasing range of actual installations.

Write for Literature

GAS and OIL BURNING

DIRECT FIRED UNIT



HEAVY DUTY FORCED AIR UNITS FOR LARGE SPACE HEATING REQUIREMENTS

A self-contained unit with adjustable discharge heads for positive heat delivery in any direction. Streamlined fire box of high heat and corrosion resisting Type 310 Stainless Steel insures a far longer life of service and satisfaction. Tear Drop combustion chamber design and convector tube arrangement affords complete efficient air wiping of all heating surface at minimum resistance. Available in models for central heating systems employing supply and return ducts.

GENERAL CAPACITY DATA
OIL & GAS FIRED HEATER

Model Number	Btu	Cfm	hp	Dimensions (inches) length-width-height	Approximate Shipping Weight
T. D.—25	250,000	3,600	3/4	60 32 81	1,300 Lbs.
T. D.—40	400,000	5,400	1	60 32 81	1,350 Lbs.
T. D.—50	500,000	6,600	1 1/2	80 32 81	1,780 Lbs.
T. D.—70	750,000	8,800	2	80 32 81	1,855 Lbs.
T. D.—80	800,000	10,200	3	80 48 81	2,110 Lbs.
T. D.—100	1,000,000	12,500	5	80 48 81	2,200 Lbs.
T. D.—125	1,250,000	15,300	5	100 54 103	3,000 Lbs.
T. D.—150	1,500,000	19,400	7 1/2	100 54 103	3,250 Lbs.

NATIONAL HEATER CO. • CLEORA & VANDALIA STS. • ST. PAUL, MINN.

A TOP QUALITY CONTROL ONLY \$13.95 DEALER PRICE

Lots of 6—\$13.45 — Lots of 12—\$12.95

Above prices include LIMIT SWITCH
and SPRING RETURN
that are usually con-
sidered extras.



You get the complete package . . .

INCLUDING LIMIT SWITCH AND SPRING RETURN

When you handle the new Crise model C-600, there are no extras to buy, no added items that might hinder the sale. Crise furnishes everything in one carton including limit switch and spring return that are usually extras.

CRISE HEAT CONTROL

FOR ALL HAND-FIRED
HEATING PLANTS

OVER 1,000,000 IN USE
FULLY GUARANTEED
THE BIGGEST DOLLAR VALUE
PRICED FOR PROFITS
PRICED TO SELL

*Write for literature and name
of nearest jobber*

CRISE MANUFACTURING CO.
COLUMBUS 16, OHIO

You'll Sell Your Customers More When You *Sell Them Clipper*



Here is a typical Clipper air-conditioning furnace with front panels removed to show easy accessibility of controls, blower and burner equipment.

HENDERSON FURNACE AND MFG. CO.
SEBASTOPOL, CALIFORNIA

Not only do Clipper automatic gas-fired furnaces with the Multi-Stream Heat Exchanger offer efficient economical heating, but also modern air conditioning for the greatest living comfort.

COMPLETE RANGE OF SIZES. Clipper furnaces are built in a range of sizes from 80,000 to 200,000 BTU.

COMPETITIVE PRICES. Despite their fine engineering, heavy gauge metals, highly improved controls and other features, Clipper gas-fired furnaces are priced in competition with ordinary furnaces.

IMMEDIATE SHIPMENT. Due to the size of the Henderson plant, equipped with the most modern machinery and to the fact that the plant is located in one of California's most productive climates where steady home-owning mechanics are available, we are able to give you immediate shipment of any model.



Compact, with baked enamel finish, the Clipper is attractive for installation anywhere. Clipper units are easily installed even in a small closet. All Clipper furnaces, regardless of size, are shipped to you completely assembled, completely wired and individually tested at the factory.

You'll Find the Clipper Enables You to Sell More—for complete information on Clipper gas-fired units and also on the details of a profitable sales representation plan, fill out and mail this coupon.

Henderson Furnace and Manufacturing Co.
Sebastopol, California

I am interested in the sales opportunities of Clipper furnaces. Please send me complete information.

Name _____

Address _____

City _____ State _____

**lead
the
way**

**with ARMSTRONG heating
equipment**

COMPLETE LINE

To be a leader in warm air heating, you must have a unit for every need or preference—any style, any size, for any fuel. Armstrong offers you a *complete* line—37 models and sizes of coal furnaces, 10 gas furnaces, 7 oil furnaces—in addition to oil burners and gas conversion burners.

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Armstrong helps you lead in sales. The Armstrong merchandising program includes all types of selling aids, from direct mail to radio, from newspaper publicity to house-to-house canvassing, with attractive bulletins to assist in closing sales.

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To maintain sales leadership you must be able to depend upon prompt delivery, and prompt delivery depends to a large extent upon production capacity. Armstrong has up-to-the-minute manufacturing plants in Columbus, Ohio and Des Moines, Iowa to provide quick handling of your orders. The Armstrong plant in Columbus is the world's largest factory devoted exclusively to the manufacture of warm air heating equipment.

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Satisfied customers are your best claim to leadership. That's why Armstrong maintains large design, development, and factory engineering departments to build years of trouble-free service into every Armstrong furnace. An Armstrong customer is a satisfied customer—that's why Armstrong jobbers and dealers are the leaders in their trade.

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using long runs alternate registers are located in the bedrooms.

Return air for this system will be handled by return air grilles located near the center of the house. The 8 by 30 in. grille in the furred-down ceiling of the hallway is of sufficient size to handle return air for the entire house. The 30 by 6 in. grille high in the side wall of the dining area is of sufficient capacity to handle return air for the living-dining rooms and kitchen-utility rooms. For additional studies and tests the system will be operated part of the time with both grilles opened and part of the time with only the ceiling grille open.

A conventional hi-boy furnace will be used with the warm air forced from the furnace bonnet downward into the pit below the furnace and out through the ducts to the various registers.

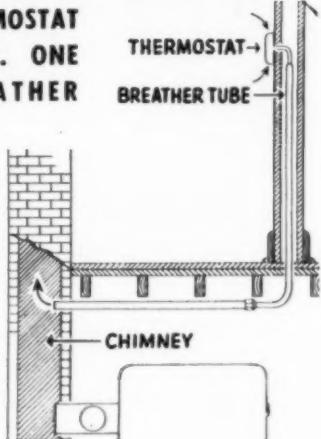
Realizing that heating such a house satisfactorily is difficult, the association has specified installation of a number of thermocouples throughout the house to accurately test the temperature variations. For the purpose of determining the characteristics of heat flow through the edge of the slab, groups of thermocouples have been installed in the slab, the ground and the foundation. Thermocouples have also been placed in the ducts. Additional thermocouples have been placed on the interior floor surfaces and at levels of 4 in., 30 in. and 60 in. above the floor and 4 in. below the ceiling in each room.

All the thermocouples will be connected by leads to the main instrument panel located in the garage which will serve as the office and instrument room for research residence No. 3.

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REVOLUTIONARY NEW THERMOSTAT
THAT PREVENTS DROOP. ONE
SETTING FOR ALL WEATHER

THERMOSTAT →
BREATHER TUBE →



One setting gives comfort in all weather because it eliminates droop. One setting gives economy in all weather because it eliminates costly overshoot. Breathe-O-Stat has all the advantages of heat anticipation and stops the big disadvantage, which is droop.

Now you have something new to offer in a thermostat that automatically compensates for changes in weather conditions. You can guarantee more comfort and guarantee fuel savings that will pay for the original cost in from 3 to 5 years. Easy to sell because the price is low. Extremely simple, no service calls. Customers can adjust themselves with 1 minute instructions from you.



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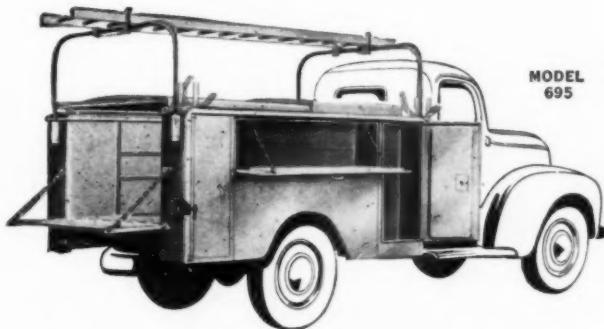
Theft! Missing power drills and saws, soldering equipment, controls, regulators, valves, tools? Make sure that your next truck body has large, self-locking, steel compartments!

3.

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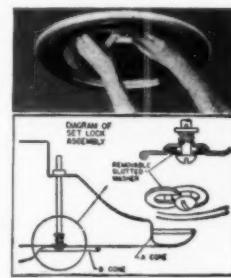
Speed installation with Kno-Draft the completely adjustable air diffusers

Helps get

job OK's faster, too!



(Fig. 1)
Self contained inner unit



(Fig. 2)
Type HD set-lock assembly



(Fig. 3)
Air Direction Adjustment



(Fig. 4) Balancing



(Fig. 5)
Air Volume Adjustment

Kno-Draft self-contained inner unit (Fig. 1) and the Type HD set lock assembly (Fig. 2) cut installation time in half, according to contractors who have used them for the first time. They're especially handy where ceilings already exist. Then it's a simple job to remove the inner assembly, attach the outer cone to collar or duct and reassemble the diffuser. The outer cone slips over the suspension bolts and is secured by a slotted washer which keeps the spring-loaded catch in compression (Fig. 2).



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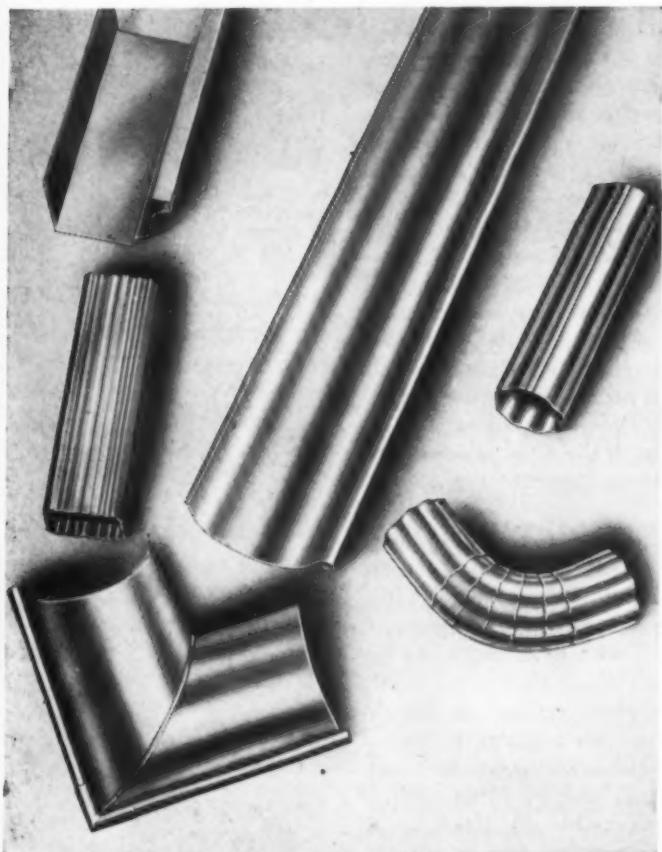
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Konzo—

Heating Basementless Homes

(From page 84)

but not the floor. These calculations can be made in the usual manner, as given in detail in Manual No. 3 of the National Warm Air Heating and Air Conditioning Association. The floor loss outwards through the edge of the floor slab will be considered separately and will be required for determining the furnace capacity. The loss through the central floor area to the ground is small and can be considered together with the edge loss.

Second step: Layout of Perimeter Duct System

Show the location of the furnace on the floor plan of the building. If the utility room has not been specified, a location near the center of the building is preferred. The lines indicating the two perimeter ducts should be sketched on the floor plan. One loop should be designated as Loop A and the other as Loop B. The two loops should be approximately of equal lengths, and neither should be more than 90 ft in total length. In many cases some ingenuity must be used to obtain a satisfactory arrangement of the duct system, and these are discussed in greater detail in the third installment of this series.

Third step: Location of Registers on Floor Plan

Indicate on the floor plan the tentative locations of

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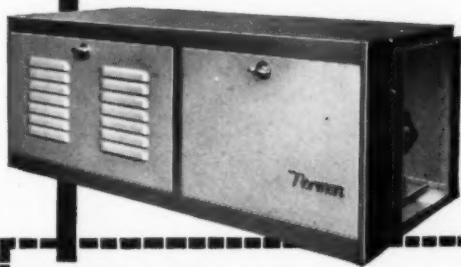
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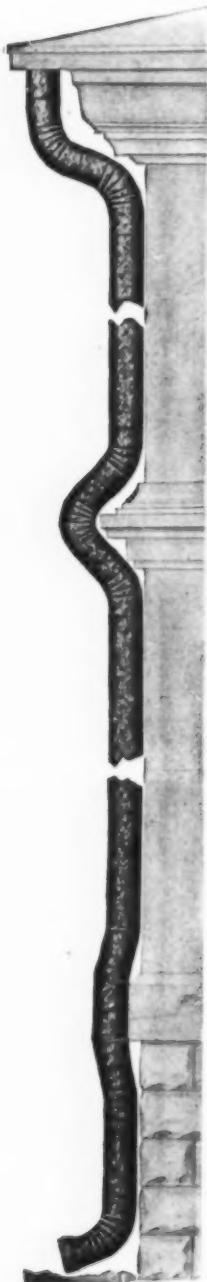
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the registers. The maximum capacity of the registers considered in this design procedure varies over a range from 6,000 to 10,000 Btu per hour, an average of about 8,000 Btu per hour. Hence, in order to determine the approximate number of registers required for each room, the total heat loss from the room should be divided by 8,000. In most cases, the number of registers thus determined will be final. Occasionally, the later steps in the procedure will indicate that one additional register is required for the room. The registers can be located any place along the perimeter duct but the discussion to be presented later about register types and locations should be consulted.

These three preliminary steps are illustrated in the example, Fig. 5. The register locations in the bathroom and kitchen indicate that some modifications may be necessary in their construction, and these details will be considered later. The next step in the procedure is to determine the capacities of the registers and their sizes.

Selection of Registers and Return Intake Sizes

Three short tables are presented for determining the sizes of the warm air and return air intakes. Table 1 is a capacity table showing the register deliveries for two sizes of registers located at varying distances from the furnace. As it will be explained later, these capacity values include both the panel heating from the floor surface and the convection heating from

GENERAL CONTROLS

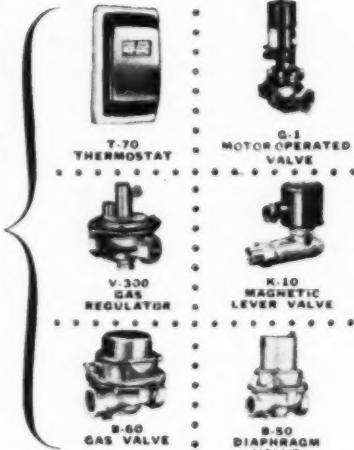
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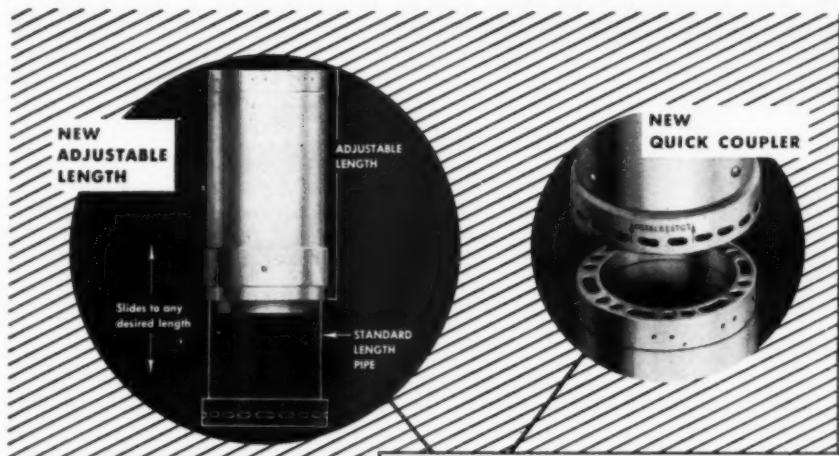
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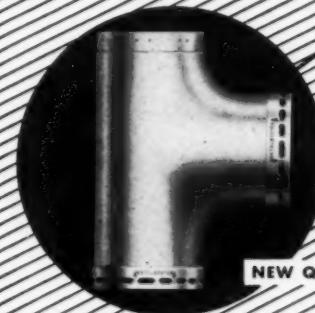
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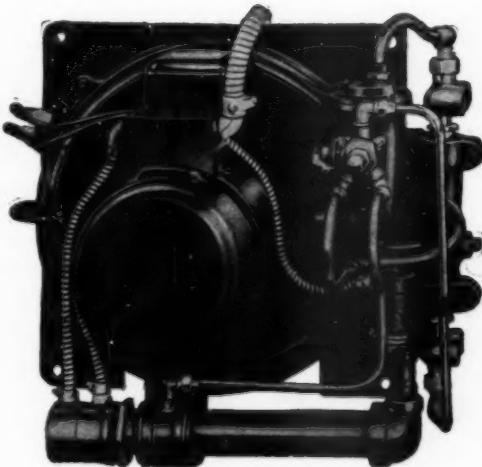
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the register. Table 2 gives approximate register sizes for the two values of free areas that were selected. Table 3 gives approximate sizes of return air intakes for various Btu capacities required. It may be noted that the free areas of the return air intakes are approximately the same as those of the warm air registers for a given room. For example, if a room requires registers having 60 sq. in. and 45 sq. in. for a combined delivery of 10,300 and 6,100, or a total of 16,400 Btu per hour, a 10 by 12 in. return air intake would be required. The approximate free area of this intake is about 75 per cent of the gross area of 120 sq in., or 90 sq in. This value is only slightly smaller than the total of 105 sq in. for the warm air registers. Since the free area velocity through the warm air registers was selected at 300 fpm, this means that the free area velocity of the return air intakes would be slightly higher. It will be indicated later that the free area velocities of both the supply registers and the return intakes were selected at low values in order to minimize the resistance to air flow.

Work Sheet and Example of Suggested Procedure

A suggested work sheet and procedure is given, together with an example to illustrate the procedure. For this purpose, the one-story house shown in Fig. 5 will be used. The numerical values are listed in Table 4.

Since a number of questions may arise regarding the assumptions that were made, methods of installation and modifications of the system will be covered in the third installment.

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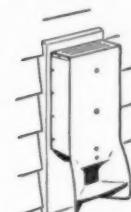
Easy to install, Saf-Aire fits into any exterior wall between two studs. Requires no chimney, ductwork or electricity to operate. Only one utility connection is needed—the gas line. Operates with equal efficiency on natural, manufactured or LP gas.

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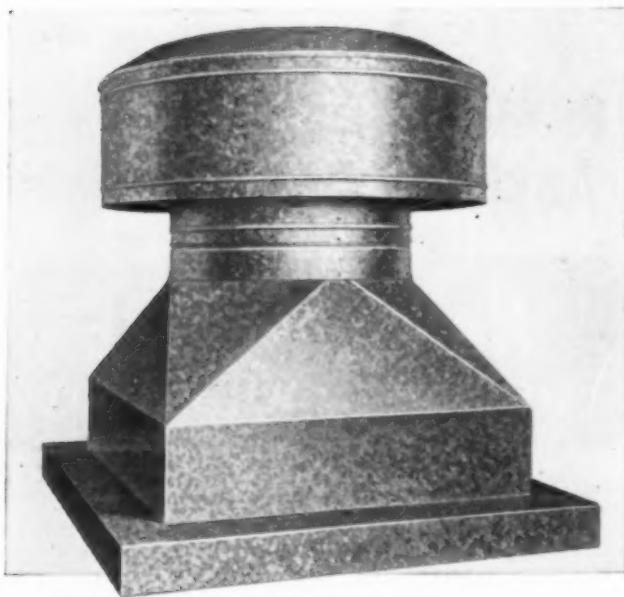
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Controlled Air Circulation

EQUIPMENT FOR EFFECTIVE ECONOMICAL
VENTILATION OF INDUSTRIAL BUILDINGS

Fundamentals of Heating

(From page 79)

From equation (2)

$$U = \frac{1}{\frac{1}{6} + \frac{1}{1.65} + \frac{4}{9.2} + \frac{4}{5.1} + \frac{1}{3.73} + \frac{.5}{3.3}}$$

$$U = .41$$

Example 5. A wall as in Fig. 7 consists of 4 in. face brick, 1 in. wood sheathing (actual thickness 25/32 in.), 1½ in. air space and ¾ in. wood lath and plaster. The conductivity k of wood sheathing is .80, the conductance a for 1½ in. air space (taken at 40 F mean temperature) is 1.10, and the conductance C of ¾ in. wood lath and plaster is 2.50:

From equation (4)

$$U = \frac{1}{\frac{1}{6} + \frac{1}{1.65} + \frac{4}{9.2} + \frac{1}{2.5} + \frac{1}{1.1} + \frac{.781}{.8}}$$

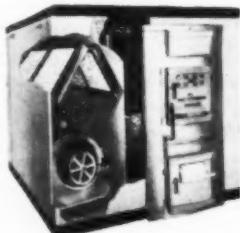
$$U = .28$$

Example 6. Given a wall as in Fig. 8, consisting of 5/8 in. clapboard, 1 in. wood sheathing (actual thickness 25/32 in.), an air space between studs and ¾ in. metal lath and plaster. The conductivity k of clapboard .80, and the conductance C of metal lath and plaster is 4.40.

$$U = \frac{1}{\frac{1}{6} + \frac{1}{1.65} + \frac{.625}{.8} + \frac{.781}{.8} + \frac{1}{1.1} + \frac{1}{4.4}}$$

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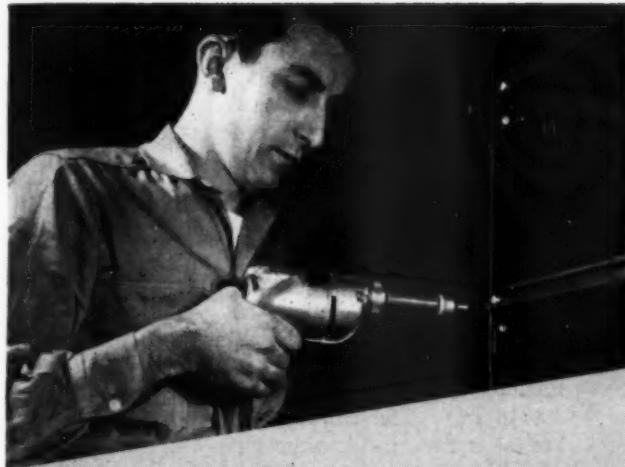


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HEATING EQUIPMENT IS YOUR BEST BUY

HERE'S WHY

LEADERSHIP IN ENGINEERING AND DESIGN Laboratory and consumer tests prove Pacific to be superior in efficiency and economy.

APPEARANCE There's none better -- We invite comparison and you be the judge.

A COMPLETE LINE Gives thorough market coverage Residential - Commercial - Industrial.

COMPETITIVE PRICES \$ for \$, value for value Pacific Heating Equipment gets the customers preference every time.

100% BACKING TO DISTRIBUTORS AND DEALERS For the first 6 months of this year possible readership of Palmer paid ads was over 75,000,000 people!

MR. DISTRIBUTOR — MR. DEALER

Here's heating equipment that has all the features for a profitable sales building operation.

Write dept. A-1 to-day for your specifications and advertising literature.

PALMER MANUFACTURING CORP.

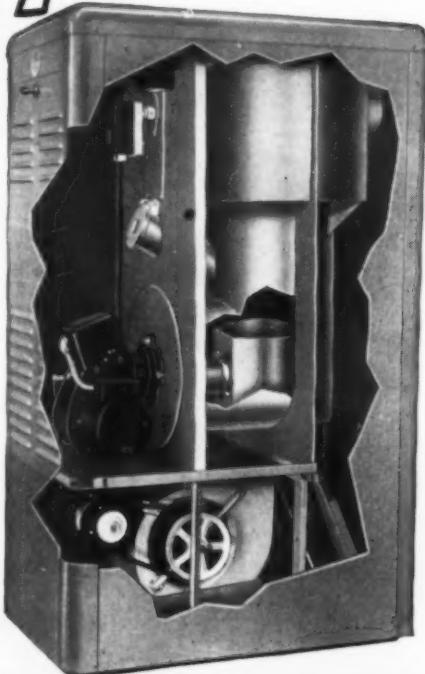
Manufacturers of the
famous SNO-BREEZE AIR COOLERS
PHOENIX, ARIZONA

LOWER YOUR INSTALLATION TIME and COSTS

The  HI-BOY

COUNTERFLOW
WINTER
AIR
CONDITIONER

OIL FIRED
HEATING UNIT
FOR SMALL HOMES



A COMPLETE PACKAGE UNIT

Complete with oil burner and automatic controls • Assembled and wired at the factory prior to shipment • Crated and shipped to the building site in one piece . . . ready for use when uncrated and fuel and power lines have been connected.

FOR RANCH TYPE OR CONVENTIONAL HOMES!

Floor space only 25" x 38"

The Certified Hi-Boy makes the basement really a livable portion of the conventional home. Both supply and return ducts enter at the top of the Hi-Boy cabinet where they will not be in the way. The cabinet itself is as attractive to the eye as any refrigerator.

In ranch type homes where utility room floor space is so valuable, the Hi-Boy is ideal. The duct arrangement leaves utility rooms uncluttered . . . simplicity of design makes it easy to clean and service in hard-to-get-at places.

Install the CERTIFIED HI-BOY—for optimum comfort and definite fuel savings for your customers . . . easy installation and service for you!

See your Certified representative or write now for bulletin No. 902-C

CERTIFIED FURNACE CO.

DIVISION OF STAINLESS & STEEL PRODUCTS COMPANY

1000 BERRY AVE. • ST. PAUL 4, MINNESOTA

$$U = .26$$

Example 7. An outside wall as in Fig. 9, consists of 1 in. stucco, 1 in. wood sheathing, an air space between studs, and $\frac{3}{4}$ in. metal lath and plaster. The conductivity k of stucco is 12.0 and the outside surface coefficient for stucco at 15 miles per hour wind velocity is 9.0:

$$U = \frac{1}{\frac{1}{9} + \frac{1}{1.65} + \frac{1}{12} + \frac{.781}{.8} + \frac{1}{1.1} + \frac{1}{4.4}}$$

$$U = .33$$

Example 8. A roof as in Fig. 10, consists of a built-up roof of $\frac{3}{8}$ in. tar, felt and gravel, 1 in. rigid celotex insulation and $1\frac{1}{2}$ in. wood deck (actual thickness 1-5/16 in.). The conductivity k of tar, felt and gravel is 1.33, and conductivity k of celotex is .34.

$$U = \frac{1}{\frac{1}{6} + \frac{1}{1.65} + \frac{.375}{1.33} + \frac{1}{.34} + \frac{1.312}{.8}}$$

$$U = .18$$

Washington Letter—

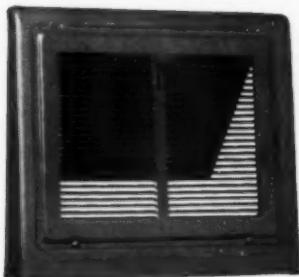
(From page 63)

It is no secret in Washington that price fixing has been one of the goals of those who are in much favor at the White House. There is now a law on the statute books which will permit the President to fix prices whenever he deems there is an emergency which threatens the national welfare. The same law as well as other laws empowers the President to take over the steel industry and other industries to preserve the

NEW STANDFORDED PERFORATION OF ALL METALS

GRAVITY BASEBOARD REGISTERS

. . . TOP QUALITY — PRICED RIGHT!



- "BEND-EZY" DESIGN
- TWO-PIECE CONSTRUCTION
- REMOVABLE FACES
- MODERN DESIGN
- EFFICIENT CONTROL
- METALLIC FINISH
- EASY OPERATION
- EXTRA STRONG

Plus the valve mechanism that holds securely with any air pressure and KEEPS WALLS CLEAN!

FORCED AIR REGISTERS—COLD AIR FACES—FLOOR REGISTERS
MIRRO-GLO LINE BATHROOM MEDICINE CABINETS
PERFORATED METALS FOR EVERY INDUSTRIAL USE

PROMPT DELIVERY. Write for information and price lists.

STANDARD

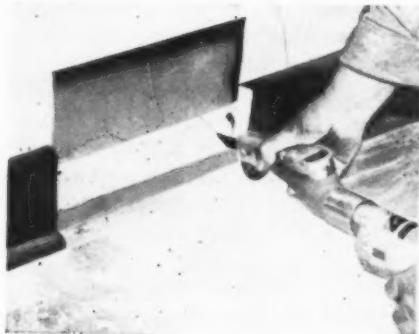
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STAMPING &
PERFORATING CO.

CHICAGO ILLINOIS

SUPER-SAW

AIR COOLED
PATS. PEND.



SUPER-SAW made this opening for wall register in jiffy time.

wearing surfaces are protected and may be replaced at very low cost. It is really a LIFETIME TOOL. SUPER-SAW is handled by better jobbers nearly every place. Or, if you prefer, write—

RCS Tool Sales Corporation

Chalstrom Bldg.

Joliet, Illinois

Tested and Approved by Leading Gas Companies
the NEW 1949 NATIONAL AUTOMAT
GAS CONVERSION BURNER



DEALER PRICE Complete with All Controls—F.O.B. Factory \$59.95
Order Today - Immediate Delivery
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519 Wyandotte Kansas City, Mo.

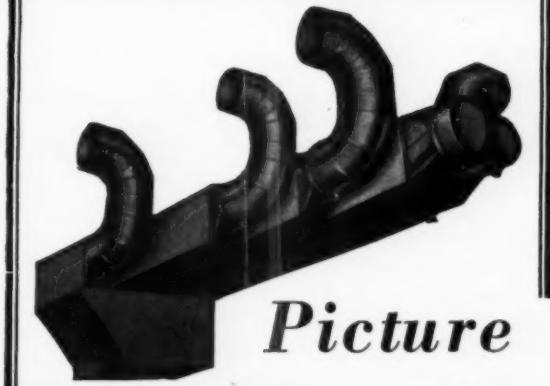
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WORLD'S LEADING HEATER FOR SUPER MARKETS

There's a proper size Reznor Heater for every heating need. Used in all types of buildings, Reznors mean extra sales for you. It is easier to sell the nation's favorite and Reznor leads all others. Big, quiet fan moves more air over more area. Write for catalog today.

REZNOR MANUFACTURING CO.
UNION ST. - MERCER, PENNA.



Picture of Profits!

Of course, our fittings are fabricated with extreme care and delivered to you with a minimum of delay—and when they are "Made-Rite" you know the job will be well done. We are ready and anxious to deal with you and you'll be pleasantly surprised at the completeness of our line and dependability of our service. *We solicit inquiries on slitting of metal up to 36 inches wide and 14 gauge and lighter.*

"Made-Rite" Co., Inc.

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Newport, Ky.

Beverly THROATLESS SHEAR

Cut any Shape... STRAIGHT OR IRREGULAR

Model B-3
with ball-bearing hold down

You can make straight or intricate cuts in the lightest metals without distortion, yet handle heavier gauges with ease on a Beverly—the shear that experience built and performance made. Smooth, powerful, clean-cutting action of the Beverly has made it the preferred shear wherever metal is cut. Ask your Dealer to show you these superior metal cutting tools . . . or write for more details and illustrated circular. Made in 4 sizes to handle 18 ga., 14 ga., 10 ga., and 3/16" mild steel. H.C.H.C. blades available for cutting stainless steel.

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Mounted on this welded, all steel stand, your Beverly is in the correct position for most efficient cutting . . . is accessible from all sides . . . makes work easy to see from any angle. Top of heavy gauge steel is drilled for mounting Shear. 30" high, the Stand can be furnished with blank top for mounting other machines or tools. Top is 7" x 11". Floor space 24" x 30".

Write for Circular
BEVERLY SHEAR MFG. CO.
3020 W. 111th Street
CHICAGO 43, ILL.

"SHEAR IT CLEVERLY WITH A BEVERLY!"

national interest. There are laws passed in this session which to all intents and purposes provide the authority that would allow the President to do almost any of the things suggested by Mr. Randall. One wonders what is the influence, and where is the influence, that impels essentially sound men like Mr. Truman and Mr. Murray to take steps which obviously lead to such dangerous positions.

Quoting again from Mr. Randall's memorable address: "Review the sequence of events. Take Inland Steel Company, for example. It is now quite clear that at no time did the union actually intend to come to an agreement with us. We were but an insignificant part of the working out of the global strategy by which the establishment of this board was to be forced upon the government. The wage demands which were presented to you gentlemen were never brought to our bargaining table. We hear of it first here. It was pensions the union asked about.

"We made an offer on pensions. We were convinced that our employees liked that offer, but the global strategy of the union required that it be rejected and that no single company be permitted to make an agreement. So we find ourselves pleading our cause before strangers, men of standing, but men who are strangers to our company and to our employees. You have never seen our plant, and never talked with our men, and it isn't human to expect that in the few brief moments we shall be before you, you can understand our problems. Collective bargaining has been destroyed. It has been repealed by the President. And if this union strategy works this time, collective bargaining will never come back. The precedent here at-

ANNOUNCING THE NEW **PEERLESS** *Thermejector* STEEL FURNACES

This is our golden anniversary—and we are making it your *golden opportunity* to sell more furnaces and more satisfaction than you have ever sold before!

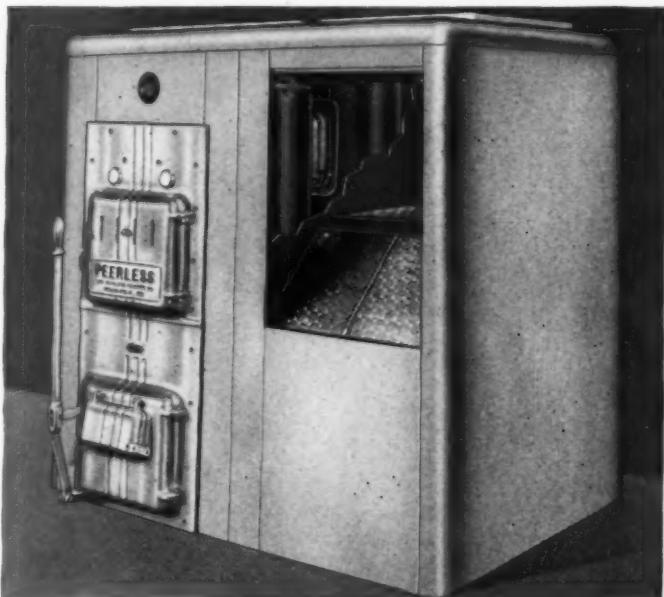
Pictured here is the new square-cased PEERLESS steel furnace, combining the super-efficient "Thermejector" combustion principle with inverted V-baffle and the powerful, silent PEERLESS blower—all in one beautiful streamlined cabinet. Then there is a similar unit with fuel-saving, easy firing, 3-way direct draft damper that prevents smoking and puffing; a model with each baffle, but without blower for straight gravity heating; and a money-saving round-cased furnace operating on each principle, for equal efficiency but lower cost. All of these extra-value furnaces are real fuel-savers, using coal, oil or gas.

Write today for NEW sales literature and let PEERLESS help make this your biggest year, for sales and profits!

PEERLESS FOUNDRY COMPANY

Pioneers in warm air heating for half a century

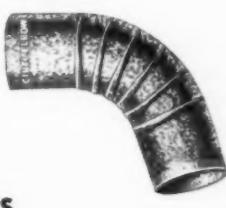
INDIANAPOLIS 7, INDIANA



Leader of the Peerless line for '49! Model C-SF Peerless "Thermejector" forced air furnace, with famous inverted V-baffle.

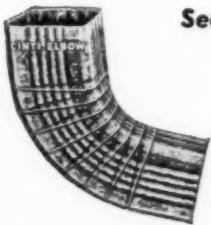
THE CINCINNATI ELBOW COMPANY

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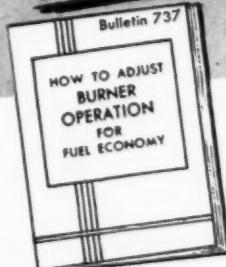
ALL SIZES
ALL ANGLES
ALL GAUGES
ALL METALS

See Your Jobber



CONDUCTOR PIPE ELBOWS and SHOES

Fuel-Saving SERVICE Simplified



below and takes less than 20 minutes of a service man's time.

FREE FACTS

The simple procedure of the heat test for adjusting burner operation for minimum fuel consumption and maximum heating comfort is clearly and completely described in the bulletin above. The bulletin also explains how this heat test dramatically demonstrates the need for replacement of an obsolete installation thus opening the way for profitable replacement business. Write for your free copy today.



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39 YEARS EXPERIENCE

WHITNEY-JENSEN

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DEEP THROAT
TOGGLE ACTION
FOOT PRESSES

The deep throats (7", 10", 18", and 24") and powerful punching action of these foot presses permit the handling of a wide variety of work, previously beyond the scope of similar equipment. All sizes, with 5 ton capacity, punch a 2" hole through 16 gauge mild steel.

Height of throat — 6-3/4"
Length of stroke — 1"

Send for Descriptive Catalog

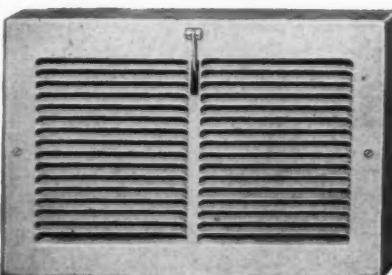
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HOMES
&
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Here's a single valve register with adjustable fins that combines quality and economy. See how you can save on air conditioning and gravity base registers. Ask your supplier or write.

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*First Choice
by Experience*

H & K GRILLES of PERFORATED METAL

THERE'S A GOOD REASON why H & K Grilles are accepted as standard by those who design and sell air conditioning, heating and ventilating systems. The range of time-tested patterns — both classic and modern — is great, with new styles being added as conditions warrant.

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Also Remember — H & K Perforated Metals for industrial applications.

**The Harrington & King
PERFORATING Co.**

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114 LIBERTY STREET, NEW YORK 6, N. Y.



**Let No. 85
up your sales!**

A warm air unit for small, basementless homes. Complete with burner and all parts ready to install. 85,000 B.T.U. Other models up to 200,000 B.T.U. High-boy models also available.

Write for specifications and prices together with the "Baltimore Plan".

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Automatic**

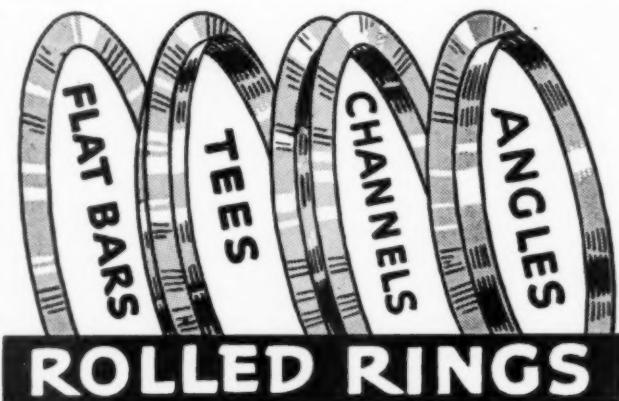
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2300 Sinclair Lane, Baltimore 13, Md.

tempted, reflecting the similar attempt made in 1946, will commit us to boards and government wage fixing forever.

"No thoughtful person will be deceived by the naive suggestion that your findings are to be recommendations only. The moment your announcement is made every power of the government will be brought to bear to compel both sides to accept your conclusions. An attempt will be made to forget the word 'recommendations', and to whip up public opinion to force company acceptance. This, I say, my company will resist.

"No increase in cost whatever should take place at this time. To increase cost in a falling market is to invite disaster. Rising costs inevitably bring lower volume and unemployment. We are in a rapidly changing market. The battle now is to maintain production, and industry needs lower costs, not higher.

"The system that brings you here is wrong, tragically wrong. I repeat, that is a revolution. It is a different America if three men are permitted to substitute their judgment for that of hundreds and thousands of managers of individual businesses all over the country. President Truman recently criticized the bigness of business. But the bigness which he has here created is a bigness so incalculable that it can destroy America. It is a bigness that denies every American tradition and that must be resisted if America is to remain free. In my opinion, it will be resisted. This, now, at this moment, is America at the crossroads. This is labor monopoly given its blessing by government, and by the same government that cries 'monopoly' at management. Mr. Murray's is a single voice for all unions in



ANGLE RINGS—Accurately Rolled or Rolled and Punched to Specification or Stock Sizes. Write for Stock Size List, Prices and Discounts. Other Rings Rolled or Rolled and Punched to specification —Channel, Tees, Rods, Flats, Pipe, Tube.

SHEET METAL PRODUCTS FABRICATED TO SPECIFICATION

Shearing 12 ft. $\frac{1}{4}$ in.—Punching 210 Ton Cap.—Forming 15 ft. $\frac{3}{8}$ in. Greater thickness in shorter lengths. Assembling—Welding (Arc. Acet. Spot) Riveting Single Units or in Quantity.

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2140 So. Sawyer Avenue • Chicago 23, Illinois

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Fill Your Warm Air Needs

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All Three Designed to Give You

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Iowa's Largest Heating Wholesaler

DES MOINES FURNACE & STOVE REPAIR CO.

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Rolled-Rite STEEL ANGLE RINGS

Rolled to a true circle—Rolled-Rite Steel Angle Rings go or easily, fit tight—assuring a flush, tight joint—and outlast the sheet metal pipe they join.

Try these money-saving Rolled-Rite Steel Angle Rings on your next *Heating, Ventilating, or Air Conditioning Job* and see the difference.

Write or telephone for list of sizes and price sheet.

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3733 South Rockwell Avenue Chicago 32, Illinois

MOUNTING FUEL COSTS ARE CREATING
MORE AND MORE STOKER CUSTOMERS
FOR ME. I HAVE FOUND ECON-O-COL
STOKERS MEAN FASTER SALES
... FEWER SERVICE CALLS!



ECON-O-COL

The "Stronghearted" Stoker

BUILT BY COTA TRANSMISSION
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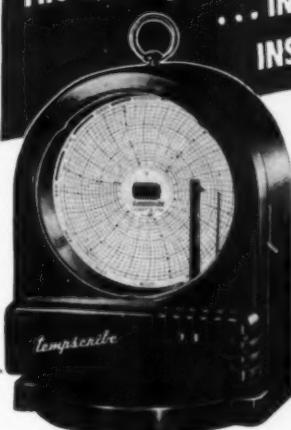
TWELVE SIZES...

30 TO 1250 LBS.
PER HOUR

WRITE FOR DETAILS OF
THIS COMPLETE LINE OF
PRECISION-BUILT, HIGHEST-
QUALITY STOKERS



The **tempscribe** RECORDER
... INDISPENSABLE for SALES,
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- SHOWS NEED FOR REPAIRS OR MODERNIZATION OF HEATING INSTALLATIONS!
- DEMONSTRATES THE HEATING COMFORTS THAT WILL RESULT FROM THE RECOMMENDED IMPROVEMENTS!
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The TEMPSCRIBE Temperature Recorder makes round-the-clock records that show highest and lowest temperature for 24 hours, temperature extremes, and frequency of temperature fluctuations. Compact, self-contained; no electrical connection, requires no watching.

The TEMPSCRIBE can save your time and money on service calls—and build your reputation for reliable, expert service.

Ask your jobber about TEMPSCRIBE Recorders, or write for Bulletin 704.

BACHARACH INDUSTRIAL INSTRUMENT CO.
7000 BENNETT STREET, PITTSBURGH 8, PA.

Also Available!
MOTOR OPERATION RECORDER

... records on-and-off periods showing cycling frequency, length of running time, and percent-age of heating capacity utilized.



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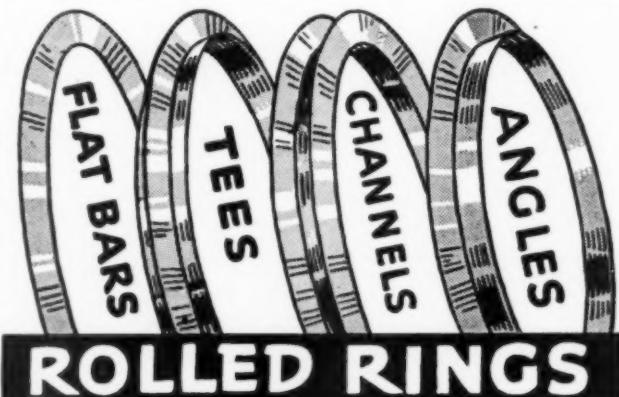
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BUILT BY COTTA TRANSMISSION
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TWELVE SIZES...

30 TO 1250 LBS.
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Recorders, or write for Bulletin 704.

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Also Available!
MOTOR OPERATION RECORDER
... records on-and-off periods showing cycling frequency, length of running time, and percent-age of heating capacity utilized.

A Great New Team!

1 Western Rotary Vent
2 Western Curb-mounted Fan

You've Always Known...

Western Rotary Turbine Ventilators—in all sizes from 6" through 48" throat. With lifetime guaranteed ball bearings. Both bearings on same axis always stay in alignment.

Now Meet the New...

Western Curb-Mounted Fan. Designed so fan diameter is the same as throat diameter. This means more air for less money. See why. Send for our new catalog No. 49F.

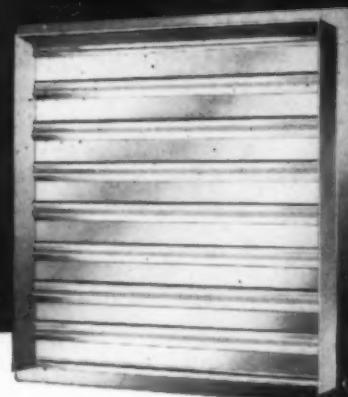
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WESTERN ENGINEERING & MFG. CO.

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they all want

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A-555

THE
AUTOMATIC
SHUTTER
WITH ALL THE
FEATURES

Front View—Closed

IT TAKES THE LOAD OFF THE FAN!

Aluminum louvers open fully, permitting capacity fan operation. New heavy reinforcement strip adds strength and long life to the louvers, assures quiet operation and perfect counterbalance, prevents rattling. Deep shroud protects shutter from high winds. Tie-rod, brackets and bearings inside frame, not exposed to weather. Special finish resists corrosion. Many other features.

Write for New Air-Flo Catalog 43-C

Illustrations and details of the complete Air-Flo line.

AIR CONDITIONING PRODUCTS CO.
2340 W. LAFAYETTE BLVD. • DETROIT 16, MICH.

the steel business. He holds the power to suspend steel production in every steel plant in the country, and suspend it, too, in plants that use the production of that industry. Through political alliance with the government which possesses the power to induce the President of the United States to take extra-legal action at his request."

It has become quite clear in the presentation before the board that the union is less concerned with the increase in wages than it is in pensions and social insurance. The union asks for a 30 cent increase, which it calls a "package." The "package" is split this way: for pensions, 11.23 cents; for pay envelopes, 12.5 cents; for social insurance, 6.27 cents. The union asks as pensions \$125 monthly for voluntary retirement at 65 or later, and \$150 monthly for disability retirements which would drop to \$125 at the age of 65. The 6.27 cents for social insurance comprises five items: 1.51 cents for group term insurance, equivalent to a year's income; .75 cents for a paid-up life policy of \$1,250 at retirement; 1.34 cents for sickness pay of \$31.50 a week for 26 weeks; 1.95 cents for hospitalization, and .72 cents for surgical fees up to \$200.

The pension question is the most controversial issue. The steel people usually say it does not come within the scope of any contract or bargain now in existence with the union. The U. S. Steel Corporation implies that the union is acting in bad faith in injecting pensions into wage negotiations. The industry bases its position on the reopening clause inserted in the collective bargaining agreement last year which authorized 1949 negotiations "(A) For a general and



PENN-AIRE FURNACES

Winter Air Conditioning and Gravity

CAST IRON, COAL FIRED

Popular Price

Practical Design

Economical Operation

UNION MANUFACTURING CO. INC.

Boyertown, Pa.

EFFICIENTLY DESIGNED SATISFACTION ASSURED



Established 1906

The same jobbers who bought our turbines in our first year, 1906, are still buying of us each year, together with hundreds of others.

That should mean insurance for you.
Write for literature and prices. Jobbers in 40 States.

UNO VENTILATOR CO.
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classified

advertising . . .

Is the quick, economical way to find what you're looking for. Check the classified page each and every issue for real bargains and hard to find items. It's a quick and sensible means too, of disposing of sheet metal tools, furnaces, anything else for which you no longer have use. Check the classified pages for rates.

... you will save time
and money on every
job because . . .

YOUNGSTOWN FITTINGS FIT!

There's no lost time in juggling or cutting to fit when you use Youngstown Fittings. Our production of pipe and fittings for gravity and winter air conditioning is planned and executed with a minuteness of detail to assure you a perfect fit every time.

Get 'em from your wholesaler on your next order . . . prove it for yourself!

. . . remember

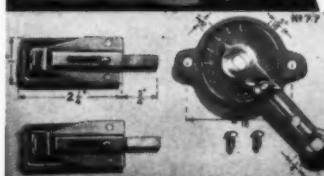
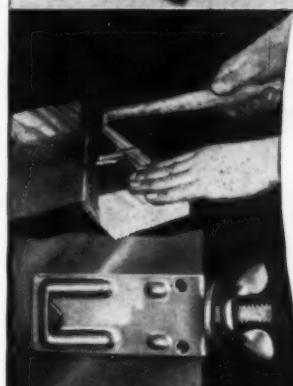
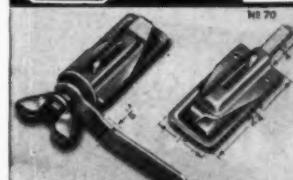
YOUNGSTOWN FITTINGS FIT!

YOUNGSTOWN FURNACE CO.

627 Marshall Street

Youngstown, Ohio

H&C Kwik-Way DAMPER REGULATOR SETS



Most Easily and Quickly
Attachable Sets on the Market

STURDY • RATTLE-PROOF
NO ANVIL REQUIRED

IDENTICAL 5/16"
RETRACTABLE BEARINGS

Simply slip the bearing over the edge of the damper at the bearing line. Lay on any firm surface and strike one solid hammer blow. The prong pierces the damper and is clinched securely in place by the heavily ribbed underside construction of bearing. Fastening is permanently solid, rattle-proof. Identical bearings with retractable bolt make easier installation of regular or splitter dampers in round or square ducts.

LIST PRICES

No. 70 Set	\$0.30
No. 77 Set	0.40

FOR LARGE DAMPERS

No. 50 $\frac{1}{2}$ Set	\$0.60
No. 80 $\frac{1}{2}$ Set	0.60

See your jobber or
write for literature.

HART & COOLEY MANUFACTURING CO.
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In Canada: Hart & Cooley Mfg. Co., Fort Erie, N. Ontario

W. A. WHITNEY HAMMERS



Riveting Hammers 12 oz.



Setting Hammers 18 oz.

Made in Black or Polished
YOUR JOBBER HAS THEM

One piece head and handle prevents breakage
and splintering.



PIPE AND FITTINGS
GUARANTEED QUALITY!

All Ajax fittings are made of high-grade, full gauge sheets . . . no seconds used! Quality is fully guaranteed. Your order, large or small, receives prompt, personal attention.

For help on your heating problems our engineering department is at your service. Contact us . . . we'll gladly work with you.

Write for catalog of Furnace Fittings.

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Division of

The Cincinnati Sheet Metal & Roofing Co.
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Scientifically designed
to reduce air friction



Double seamed
for strength
and air-tight
construction

uniform change in rates of pay and/or (B) For life, accident, health and medical benefits." U. S. Steel contends that this clause on its face precludes pension discussions, now, that its meaning is "clear, specific, and exclusive."

The union in defending the pension demand has presented a legal brief to show that pensions are wages, albeit they are deferred, and therefore are within the scope of the reopening clause. The union says its right to bargain for the pensions is not waived by failure to spell out pensions in the clause. The union's argument for a fatter pay envelope as well as its general argument on other demands was based on the industry's ability to pay as evidenced by profit trends. The union cites that the industry made a record profit, after taxes, of \$800 million in 1948, and that earnings for the first half of 1949 were at the rate of \$1.25 billion annually. The union argues that the current wage rate of about \$1.65 an hour represents an increase in real wages since 1939 of only 14 per cent and fails to reflect fairly a 49 per cent increase in productivity of the industry. The union asserts recent declines in cost of materials used in steel would be more than enough to offset the cost of the "package" without disturbing current profit levels. It is argued that a wage increase now would bolster a sagging demand for consumer goods thereby increasing production and insuring a prosperous economy for the country. Because of high profits, the union says, wages could be raised without price increases. On the question of social insurance the dispute centers on employee participation in the cost. The union asserts

THIS LABEL IS YOUR ASSURANCE
OF THE BEST FURNACE PIPE AND
ELBOWS OBTAINABLE.



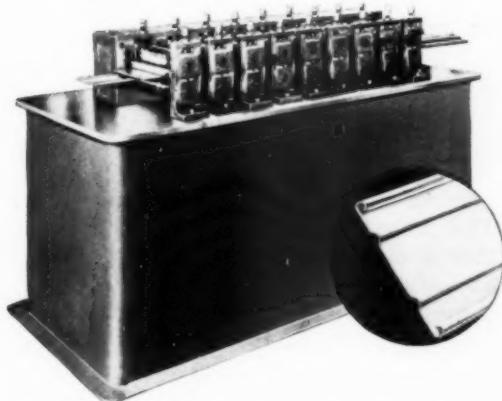
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MID-WESTERN AND ROCKY MOUNTAIN
STATES INSIST UPON SUPERIOR
FURNACE PIPE AND ELBOWS.
MANUFACTURED ONLY BY—

SUPERIOR PRODUCTS CO.

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COMPLETE IN ONE PASS!

—formed shapes of any design—



You merely feed the flat strip into the machine—out comes the finished shape.

- Production speeds up to 250 f.p.m.
- Machine shipped completely tooled.
- No experience required to operate.

Sketch or sample will bring prompt proposal

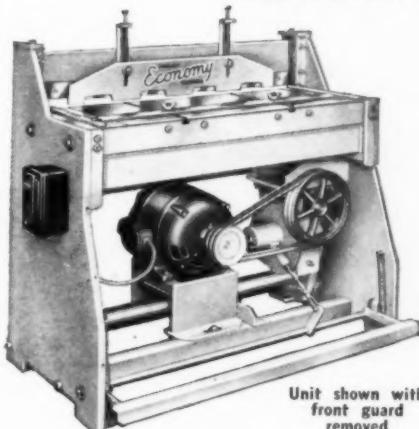
Dahlstrom Machine Works, Inc.

4974 N. Elston Ave.

Chicago 30, Ill.

Roll Forming, Slitting, Straightening, and Cut-Off Machines

New Economy P-16 MOTOR OPERATED SHEAR



Unit shown with front guard removed

- POSITIVE ACTION
- NEW DIRECT DRIVE
- ALL STEEL CONSTRUCTION
- MOVING PARTS ALL ENCLOSED
- 16 GAGE CAPACITY

A new type direct worm gear drive built into the Economy P-16 provides positive shearing action in any metal to capacity—more efficient, smoother cutting and positive control of the knife bar are possible. Minimum of moving parts, elimination of heavy fly wheels, brakes, etc., assures longer life and maximum service. All steel, properly braced construction means great strength and rigidity under most severe operating conditions.

Write for illustrated circular and prices. We are exclusive Distributors of Economy Shears and Brakes.



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Quality Products for Over 47 Years
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1929

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"Unipack"

Furnace Blower

"DOC" (WITH THOUSANDS OF SATISFIED CUSTOMERS) SAYS:

Quiet as a CAT'S PURR



FIRST furnace blower made commercially in the Middle West. . . . TWENTY years of service in thousands of homes . . . continuing demand is PROOF of PREFERENCE for QUIETER operation.

It's the operation that counts in a blower. Rugged operation that's "Quiet as a Cat's Purr" and long life are assured when you install the UNIPACK.

AMERICAN MACHINE PRODUCTS CO.

MARSHALLTOWN, IOWA

*Easy Sales
Extra Profits*

Sell VAN-PACKER
Packaged
Chimneys
FOR ANY HOME

• Hundreds of Homes Need New Chimneys
Old homes, new homes, summer cabins, motels, tourist cabins, resorts—there's a vast ready market now.

• Safest Chimney Ever Built
Underwriters' Lab. approved in place of brick. FHA accepted for all fuels in any type home . . . one or two story.

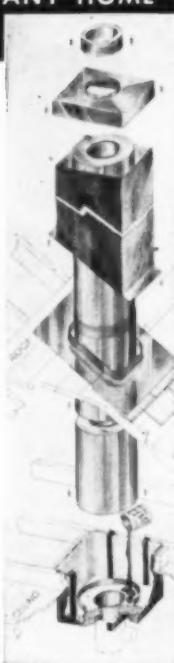
• Nationally Advertised
Thousands of inquiries from our ads are referred to dealers. Selling literature, newspaper mats free.

• Costs 20% to 40% Less Than Brick
Easily installed, summer or winter by anyone in 3 to 4 hours. Lightweight, needs no foundation. Suspends from ceiling or floor joists. A more efficient chimney with better draft.

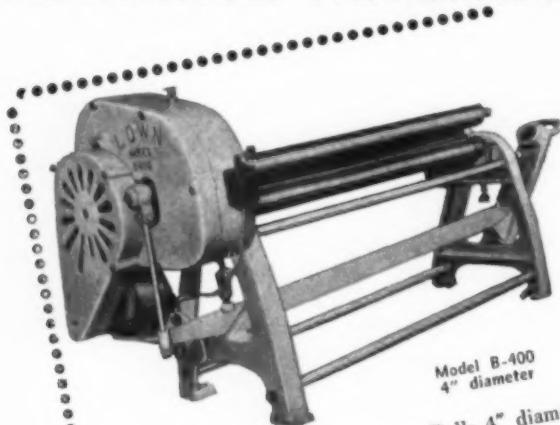
• Completely Packaged
Easy to handle, minimum stock enables you to supply any 1 or 2 story house with any roof pitch. Furnished complete, all parts for entire installation.

• Liberal Discount to Dealers
Ask your jobber about Van-Packer Chimneys or write direct.

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LOWN SLIP ROLL FORMING MACHINES



Model B-400
4" diameter

- Initial Type-Power Driven. • Rolls 4" diameter.
 - Oilite bearings - Alemite lubrication. • New type quick acting latch on drop arm. • Hand wheels on adjusting screws. • Roll position indicators. • Fast, sturdy and easy to operate. • Prompt deliveries. • Other size machines also available.
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San Angelo, Texas

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that employee contributions would constitute a wage cut, that the protection is a legitimate production cost and that it is probable the effectiveness of a contributory plan would be impaired by the unwillingness of many to participate. The industry feels that contributions by employees would give employees a greater interest in the whole program, and that most insurance authorities agree that most workable plans are those recognizing the contributory principle. The industry emphasizes benefits should not be brought about "By an act of enforced paternalism on the part of the employer."

Both sides in all sincerity are charging bad faith. It is regarded as possible that the strike which is imminent at the deadline of September 14th may be averted by the findings of the fact finders; even a better sign that the strike may be avoided is read in the union's decision in July to file non-Communist affidavits under the Taft-Hartley act. This is regarded as preliminary to the step which will allow the union to take its fight to the National Labor Relations Board. If it chooses to take that step, it would not have to strike on September 14th. At this writing, there is no sign that the fact finding proceedings will solve the contest so that a strike can be avoided, unless the union backs down, or appeals to the NLRB.

It is interesting to note that the American Iron and Steel Institute recently reported, during the past ten years, the steel industry paid \$17 billion to its employees and made 800 million tons of steel. This is the greatest volume of production in the history of the world. Recent rush orders to rebuild inventories are reported to have sent steel production back up to 80

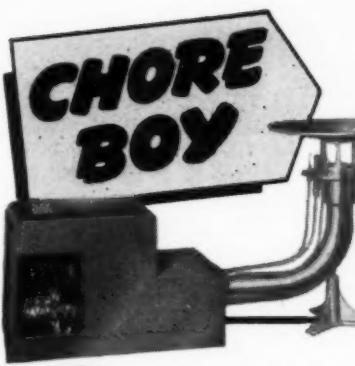
ONE SUPPLY SOURCE FOR



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Repairs
Increase
Your
Profits

Consumer demand for repair jobs is increasing and this means more profitable business for you. You can complete all your repair jobs more quickly, at less cost and with greater profit when you order all your replacement parts for furnaces, boilers, stokers, oil burners and stoves from the OMAHA STOVE REPAIR WORKS. Complete stocks of repair parts make it possible for us to fill 98% of all orders the day they are received which prevents job delay and pleases your customers. We are also set-up to give quick service on new Waterman-Waterbury furnaces, blowers, fittings, registers, incinerators, water heaters and all types accessories and sundry items.

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Approved by
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Unquestionably THE FINEST GAS BURNER

Only Chore Boy offers all the top 11 features:

- All controls enclosed and protected by case
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- Stronger, more durable parts plus quality Minneapolis-Honeywell controls.
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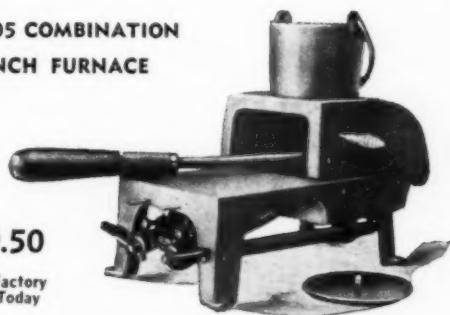


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JOHNSON

No. 105 COMBINATION
BENCH FURNACE



\$19.50

F.O.B. Factory
Order Today

Highest Temperature Without Forced Air Blast

This fast, efficient JOHNSON Bench Furnace is used for both heating and melting. Designed for heating soldering coppers up to 12 pounds per pair. Also for heat treating, case hardening and tempering carbon steel tools. Two burners, each equipped with shut-off valve and pilot light deliver temperatures up to 1800° F. without a blower. Firebox 3½ x 4½ x 5½, lined with firebrick. 3" cast iron melting pot sets in hood by removing lid. Melts lead, babbitt, tin, zinc. Capacity 10 lbs. A very economical and useful furnace for your shop.

Write for FREE Catalog of JOHNSON
Bench and Soldering Furnaces,
Torches and Blowers

JOHNSON GAS APPLIANCE CO.
580 E AVENUE N.W.
CEDAR RAPIDS, IOWA

It pays to buy a good tool . . .

It pays to buy a



**KENT Products are
BUILT TO LAST!**

**Backed by 36 Years'
Experience**

KENT DOUBLE SUCTION FURNACE CLEANER

Machine can be separated in 2 parts for easy carrying . . . and it's built to last, giving long and efficient service. Two fully protected fans attached directly to the heavy duty motor and mounted beneath can give low center of gravity.

KENT Features

- No Outside Dust Bag
- Bag Easily Emptied
- Powerful Double Suction
- Fully Guaranteed

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435 Canal Street

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Representatives in Principal Cities

MEMO . . .

From: Galvan Mfg. Co.

TO: The Sheet Metal Trade

We can now supply the NEW GALVAN Conductor Pipe Elbows as well as "Crary's" Cut-Offs, and "Tite-Top" Funnels. With your next order to your jobber ask him to supply . . .

GALVAN Conductor Elbows

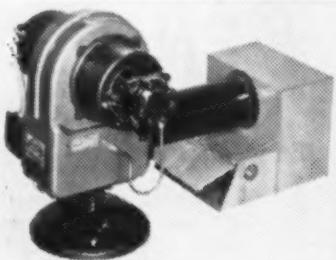
GALVAN "Crary's" Cutoffs

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GALVAN MFG. CO.
NEW ALBANY, IND.

HERE IS THE ANSWER



A
Combination
Oil and Gas
Installation

ECONOMICAL - DEPENDABLE COMPLETELY AUTOMATIC HEAT

The installations are 100% thermostatically controlled and automatically operated. Combines gas with oil for economy—assures constant, plentiful supply of fuel at all times. DEALERS: Write for literature and details—some choice territories still open.



SIEMON & CO. 3025 Main St., Kansas City, Mo.



The Demuth Patented "draftless" Air Distributor, the only diffuser with the Patented Air equalizing vanes within the

device. Positive diffusion and aspiration—over the 360 degrees of the outlet. Used by discriminating users throughout the country. Available in Aluminum, Steel and other metals to order.

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CHARLES DEMUTH & SONS, INC., Mfgs.
Mineola, N. Y. Est. 1905

ALMAR EASY SLITTER

FOR USE WITH BRAKE OR BENCH

Speed up your work—without an 8' or 10' Square Shear
The Rotary action of cutters produces a neat, accurate clean edge.



PRICE—COMPLETE
Almar Easy Slitter
with cutting head & track
8' Brake Type — \$60.00
8' Bench Type — \$75.00
10' Brake Type — \$65.00
10' Bench Type — \$85.00
F.O.B.—Chicago, Ill.

WARD MACHINERY COMPANY
564 W. WASHINGTON BLVD. CHICAGO 6, ILLINOIS

per cent of capacity.

To sum up, the White House is much interested in slowing down "disinflation." It doesn't want falling prices. And it doesn't want strikes. The talk in Washington is that the fact finding board and all other government agencies working openly or sub rosa will make a great off-the-record effort to get a voluntary agreement between the companies and the unions. To the bystander, a voluntary agreement seems very, very remote.

Safety Pays!—

(From page 95)

can be noted and corrected.

Make inspection of operations.

All the operations of the shop should be examined to locate any unsafe conditions that need immediate attention. Any hazards which exist should be eliminated as a preliminary step in the program.

Provide mechanical safeguards.

Wherever a danger point can be found on any machine safety guards should be provided or installed. This action will convince the workers that the program is in earnest.

Provide facilities for rendering first aid.

It is very important to have first aid available in the shop. Many injuries can be minimized if they are treated swiftly and competently.

Tell the employees all the details.

Everything about the safety program should be thoroughly explained to the men so that they will understand the reason for every safety rule which is set up. Without their interest and cooperation no

BRAUER has

REPAIR PARTS for all FURNACES
BOILERS, STOVES • Guaranteed to FIT

A. G. BRAUER Supply Co.

2100 Washington Ave.

St. Louis, Mo.

IMPROVED!



• B.B. •
No. 12 SHANK
33 1/3 % STRONGER

IMPROVEMENT IS APPLIED TO
No. 15—SQUARE, No. 12— $\frac{1}{4}$
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SOLD THRU LEADING
JOBBERS EVERYWHERE

BERGER BROS. CO.

Main Office & Factory
228-237 Arch St., Philadelphia, Pa.

SEQUOIA FURNACE

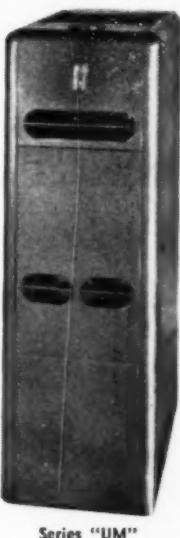
New "Slim" Design requires

LESS FLOOR SPACE
THAN EVER BEFORE!

Only 20" wide and 30" deep, Sequoia's new 70,000-BTU WINTER AIR CONDITIONER saves valuable floor space in basement, kitchen, utility room or closet. Ideal for small homes and housing projects. For larger homes, full range of sizes up to 175,000 BTU, with lines correspondingly slim.

Streamlined and handsome, Sequoia adds beauty to the home. It serves dependably, quietly, automatically—the year around. It's A.G.A. approved for natural, manufactured and liquefied petroleum gases... for both high and low altitudes.

Here's a furnace that will move fast from your sales floor. Ask now for full information on this most modern of lines—then judge for yourself!



Series "UM"
Gas-Fired

Inquire of Your Jobber, or Write—

SEQUOIA MANUFACTURING COMPANY

1000 Britton Ave.

San Carlos, Calif.



DRILL BILLY says:



AND SAVING, TOO, WITH THE ORIGINAL

ROTARY CONCRETE DRILL BITS"

"You wouldn't send a boy to do a man's job. Then why try drilling holes in concrete with anything

but a Rotary Concrete Drill? It's the man among boys in masonry drills. Write for illustrated folder giving all money-saving details

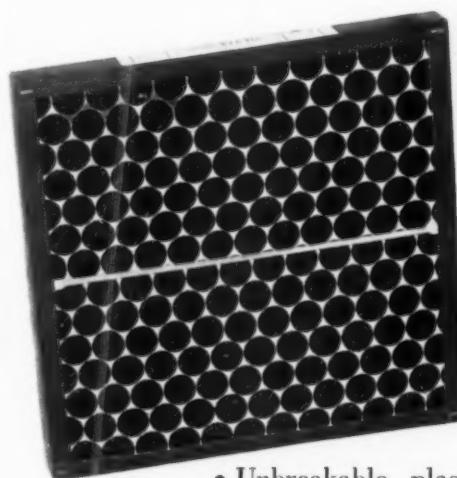
FREE FACTORY RE-SHARPENING until further notice



ROTARY CONCRETE DRILL COMPANY

650 SOUTH ARROYO PARKWAY • PASADENA 1, CALIFORNIA

The PLASTI-STATIC AIR FILTER features



SIX
NEW
AIDS
TO
AIR
CON-
TROL

• Unbreakable plastic filament

- Less "handling" hazard
 - Natural impinging qualities
 - Greater dust holding property
 - Metal screen center sandwich pad
 - Plastic filaments are non-combustible.
- Write for details today.

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The Mercoid Way

You simply use your fingers—no tools whatever are needed. On either the Type M-41 Furnace Limit Control or the Type M-43 Furnace Fan Control, the adjustment mechanism is alike. This is only one of the many other features you'll like about Mercoid Controls.

Write for Mercoid Catalog

THE MERCOID CORPORATION, 4203 W. BELMONT AVE., CHICAGO 41, ILL.

safety program has a chance of succeeding.

Consider engineering revisions.

It may be necessary to make some engineering revisions to improve the machinery used or methods of operation in order to carry out the safety program. Usually these changes pay for themselves in increased production or efficiency.

A well planned safety program, properly administered will produce several results. It will make the shop a safer and more pleasant place in which to work, reduce the indirect expenses due to accidents, and help keep insurance premiums at the lowest possible rate. *Safety Pays!*

News Summary . . .

(From page 72)

Anthracite Cures Tobacco

EXPERIMENTS IN THE APPLICATION of anthracite fired equipment to warm air drying of tobacco have proven successful in North Carolina. One of the principal reasons for this application is the fact that the products of combustion of anthracite can be discharged directly into the barn, thus minimizing need for duct-work.

During the 1947 and 1948 seasons, engineers of the anthracite producing companies, stoker manufacturers and the Anthracite Institute cooperated with the agri-

THOR GOVERNMENT CLIP DIES

**SHEAR - PUNCH A 5/32" HOLE - MARK POINT AT BREAKLINE
ALL IN ONE OPERATION!**

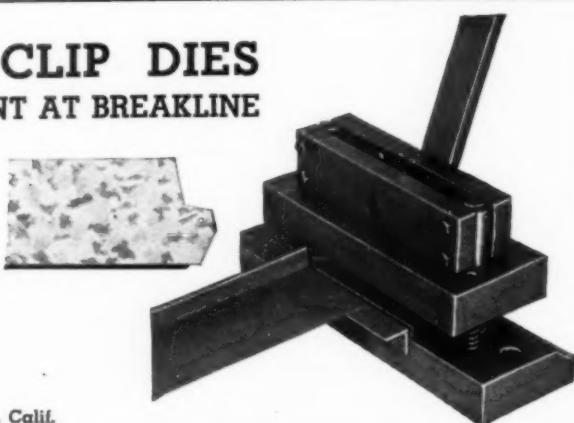
**Model No. 100 Capacity 22 gauge
Model No. 200 Capacity 18 gauge**

These bench model hand-operated dies are designed to speed up work in all sheet metal shops doing heating and ventilating. No waste of time in punch press set-up. Dies can be taken along on outside jobs.

Made By Skilled Die Makers

See your local dealer or write for literature and samples of metal sheared in dies.

THOR TOOL AND DIE CO. 3444 Morrison Ave., Oakland 2, Calif.



Nine Out of Ten Buy E-Z-ONS Again **E-Z-ON Damper Regulators**

ORDER FROM YOUR JOBBER..

Chicago Steel Bending Brake



**DREIS & KRUMP MANUFACTURING CO.
7404 LOOMIS BLVD. • CHICAGO 36, ILL.**

Heating
Sheet Metal



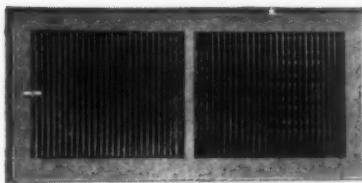
Air Conditioning
Supplies

Furnace pipe, adjustable
elbows and Fittings

ALSO: Complete line sheet metal hand tools

Frank X Enderle, Inc., Ltd.

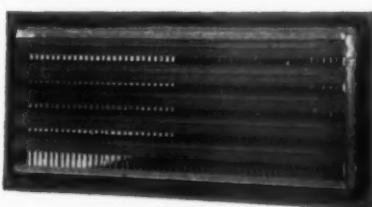
1600-1700 San Fernando Road, Los Angeles 41, Cal.



FRONT
VIEW

No. 30 Vertical Fin Multiple Louver

REAR
VIEW



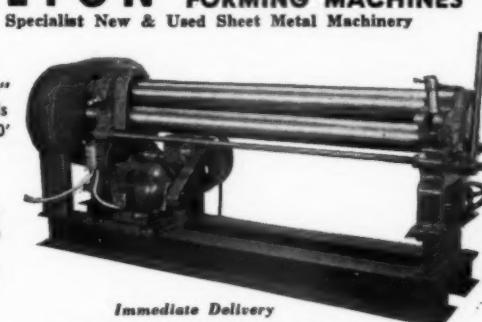
IMPROVE THE
APPEARANCE AND PERFORMANCE
OF YOUR INSTALLATIONS . . .

USE **MIDCO'S** NEW NO. 30
FOUR WAY DEFLECTION REGISTERS

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MILTON SLIP ROLL
FORMING MACHINES



SIZES
1" to 6"
Dia. Rolls
16" to 10'
Long

ROLLS
UP TO
1/4"
PLATE

Immediate Delivery

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402-408 RACE ST. PHILADELPHIA 6, PENNA.



Std. Arr. No. I
for Belt Drive

Write us about your problems. Send for Bulletin No. EX-41

BAYLEY BLOWER COMPANY
1817 South 66th Street Milwaukee, Wis.

New and improved "EX" Fans are now available in standard sizes from No. 15 to No. 80 and from 200 to 30,000 CFM Capacity with pressures up to 15" W.G. These fans are commonly used for exhaust problems to handle dust, fumes, shavings, etc., but can be adapted for forced draft service.

"EX" Fans are furnished in all standard arrangements of the N.A.F.M. The design is such that it can be easily modified to suit special assemblies, thus "EX" Fans are ideal for resale purposes, as part of factory assembled units.

Sodering Aluminum is easy

WRITE
TODAY
FOR FREE
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Permanent aluminum soldering is made simple and easy with ALLEN Alumi-Soder. Complete in itself, flux and solder are combined in exactly the right proportion in a convenient "handy-to-use" stick.

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CLINKER TONGS FURNACE POKERS
ASH REMOVERS FIRE RAKES

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Stocked by leading jobbers everywhere.
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WINTER FORECAST: Fair and Warmer with Super Cleaned Furnaces

Get heating plants in shape for the winter. No time to lose now. A Super Red Streak Furnace Cleaner will do the job in a jiffy. Earn you a nice profit, and reveal necessary repairs and replacements. Avoids costly and inconvenient breakdowns.

The Super cleans chimneys, too, from the bottom up. No hazard to the operator or discomfort to the household.



Any one can operate the Super without special training. Try a Super 5 days free. You keep what you make.

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SHALLO-WELL

OIL-FIRED FLOOR FURNACES
Only 34 inches high
BTU CAPACITIES OF
★ 50,000 ★ 60,000
★ 70,000

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Repair parts for Vernois Furnaces are quickly available at our plant. When you need them write us at once. You'll give the customer a better job and assure yourself a more profitable one by using only Vernois parts.

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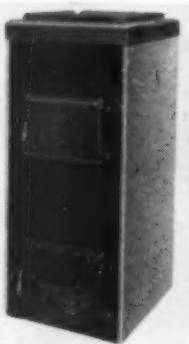
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BASED ON REPORTS from companies having 94 per cent of the steel capacity of the industry, the operating rate of the steel industry was scheduled to be 83.5 per cent of capacity for the week beginning August 15, 1949, equivalent to 1,539,300 tons of steel ingots and castings for the entire industry, compared to 1,517,200 tons scheduled to be made the week before, 1,712,400 tons one year ago, and 1,281,210 tons for the average week in 1940, the highest prewar year.



A LOW COST FACTORY-ASSEMBLED UNIT

For Small or Medium Homes

Completely assembled, wired and adjusted. Available for coal, gas or oil fired. Territories still open. Write or wire today for details.

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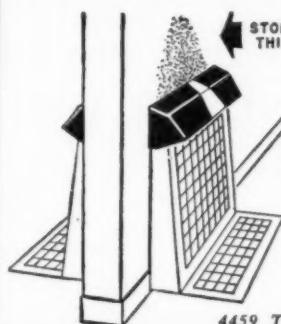


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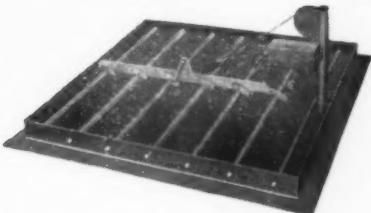
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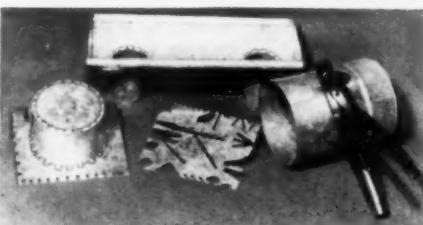
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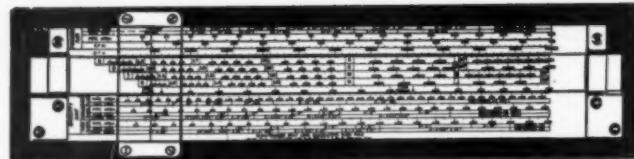
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wanted

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Los Angeles 21, Calif.
Trinity 4713

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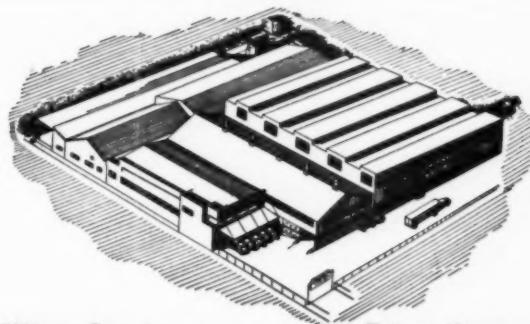
lines wanted

Heating accessories, controls, etc. wanted by well established manufacturers representative with good following who specializes in heating to jobber accounts, etc. in Washington, Oregon and Idaho. Address Key #782, American Artisan, 6 No. Michigan Ave., Chicago 2.

situations open

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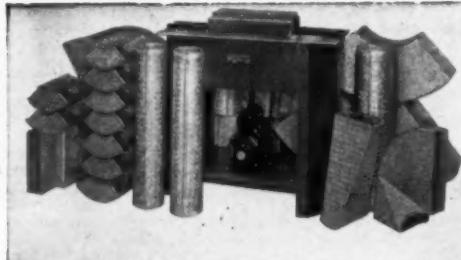
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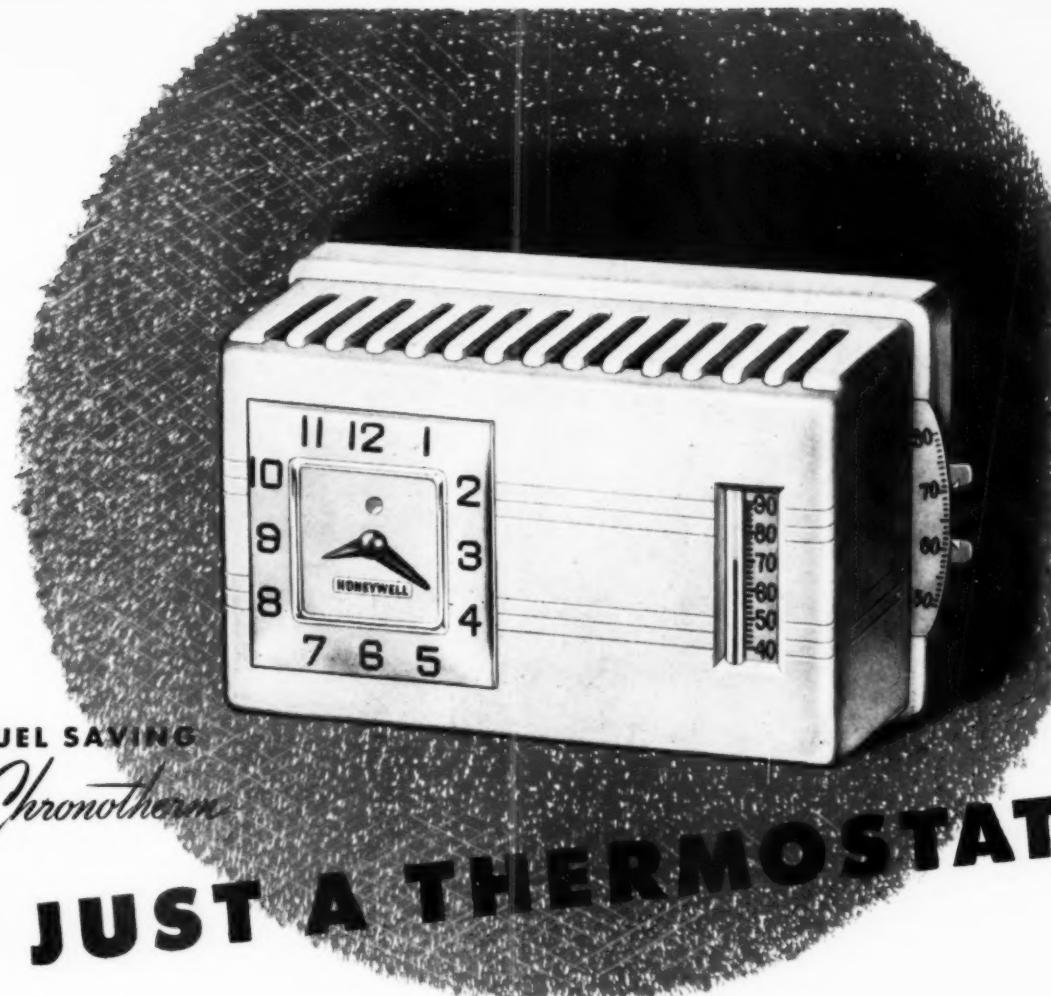
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INDEX TO ADVERTISERS

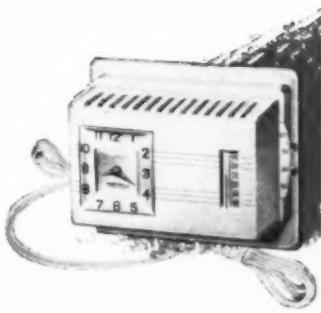
A & A Register Co., The.....	175	Fairbanks Morse & Co.....	*	Penn Boiler and Burner Mfg. Corp.....	*
Acme Electric Welder Co.....	187	Fallsington Mfg. Co.....	*	Penn Electric Switch Co.....	32
Acme Equipment Co., Inc.....	181	Federated Metals Division.....	*	Penn Ventilating Co.....	*
Acme Manufacturing Co.....	141	Field Control Div., H. D. Conkey & Co.....	38	Perfection Stove Co.....	123
Adams Co., The.....	187	Fireline Stove & Furnace Lining Co. 187 & 189		Perfex Corp.....	143
Delta Mfg. Co., Inc.....	44	Firewel Co., Inc., The.....	188	Permanente Metals Corp.....	50
Aerofin Corp.....	149	Foilansbee Steel Corp.....	*	Petersen Mfg. Co.....	*
Air Conditioning Products Co.....	178	Forest City Foundries Co., Inc.....	127	Potts-Farrington Co.....	191
Air Controls, Inc.....	135	Gallaher Co.....	188	Premier Furnace Co.....	116
Air Controls Prod., Inc., Inside Front Cover		Galvan Mfg. Co.....	183	Quiet Automatic Burner Corp.....	130
Airtemp Div. of Chrysler Corp.....	139	General Controls.....	166	R C S Tool Sales Corp.....	173
Airtherm Mfg. Co.....	*	General Filters, Inc.....	144	Randall Graphite Bearings, Inc.....	121
A-J Mfg. Co.....	157	General Oil Burner Corp.....	176	Reiner & Campbell Co., Inc.....	*
Ajax Furnace Fitting Co.....	180	Gerett Corp., M. A.....	186	Reinhard Bros. Co.....	181
Allen Co., Inc., L. B.....	187	Gerhardt Co., Inc., George T.....	*	Republic Steel Corp.....	57
American Air Filter Co., The.....	*	Gilbert & Barker Mfg. Co.....	24 & 25	Research Products Corp., Outside Back Cover	
American Brass Co.....	47	Goergen-Mackwirth Co., Inc.....	*	Revere Copper & Brass, Inc.....	105
American Machine Products.....	181	Great National Air Conditioning Corp.....	*	Rex Clay Products Co.....	*
American Radiator & Standard Sanitary Corp.....	20	Hall-Neal Furnace Co.....	37	Reynolds Metals Co.....	54
American Screw Co.....	113	Hansen Tool & Die Co.....	*	Reznor Mfg. Co.....	173
American Zinc Institute.....	*	Harrington & King Perforating Co.....	176	Richmond Radiator Co.....	49
Anchor Post Products, Inc.....	*	Hart & Cooley Mfg. Co.....	19 & 179	Roto-Table Company.....	189
Anemostat Corp. of America.....	117	Heil Co.....	140	Rotary Concrete Drill Co.....	185
Anthracite Institute.....	59	Henderson Furnace & Mfg. Co.....	161	Royal Heaters, Inc.....	14 & 15
Armco Steel Corp.....	118	Henry Furnace Co., The.....	34	Rybolt Heater Co.....	18
Armstrong Co., The.....	152	Herco Oil Burner Corp.....	*	Ryerson & Son, Inc., Joseph T.....	60
Armstrong Furnace Co.....	162	Hess Co., The.....	*	Sail Mountain Co.....	*
Atlas Mfg. Co.....	165	Homer Furnace & Foundry Corp.....	149	San Angelo Fdry. & Machine Co.....	182
Auer Register Co.....	21	Hussey & Co., C. G.....	*	Schaefers Brush Mfg. Co.....	120
Automatic Firing Corp.....	*	Illinois Testing Laboratories, Inc.....	122	Security Mfg. Co.....	146
Automatic Humidifier Co.....	147	Independent Pneumatic Tool Co.....	23	Sequona Mfg. Co.....	185
Automatic Products Co.....	52	Independent Register Co.....	151	Siemon & Co.....	184
Bacharach Industrial Instrument Co.....	175 & 177	Inland Steel Products Co.....	88	Skilsaw, Inc.....	171
Barber Colman Co.....	156	International Nickel Co., Inc., The.....	137	Skuttle Mfg. Co.....	28
Barber Gas Burner Co., The.....	147	Johns-Manville Corp.....	*	Smith, R. E.....	164
Bauer & Black, Div. Kendall Co.....	*	Johnson Co., S. T.....	167	South Wind Div., Stewart-Warner Corp.....	169
Bayley Blower Co.....	187	Johnson Gas Appliance Co.....	183	Standard Electric Mfg. Co., Inc.....	*
Berger Bros. Co.....	184	Jones & Brown, Inc.....	*	Standard Fuel Engineering Co.....	183
Berger Mfg. Co., Div. of Republic Steel Corp.....	*	Juniper Elbow Co., Inc.....	*	Standard Stamping & Perforating Co.....	172
Bethlehem Steel Co.....	133	Kaustine Co., Inc.....	43	Steel Products Engineering Co., The.....	51
Beverly Shear Co.....	174	Kent Company, Inc., The.....	183	Stefco Steel Co.....	*
Bishop & Babcock.....	*	Kirk & Blum Mfg. Co.....	189	Stokol-Stoker Co., Inc.....	*
Black & Decker Mfg. Co.....	159	Krueger Sentry Gauge Co.....	6	Sunstrand Hydraulic Co.....	*
Brandes Company.....	153	Lexington Supply Co.....	*	Sundstrand Machine Tool Co.....	*
Brauer Supply Mfg. Co., A. G.....	184	Lima Register Company.....	*	Superior Products Co.....	180
Brenner Co., Jacob.....	158	Locke Stove Co.....	33	Surface Combustion Corp.....	46
Breuer Electric Mfg. Co.....	*	Lockformer Co.....	9	Swartwout Co.....	170
Brundage Co.....	145	M-A. Inc.....	*	Synromatic Corp.....	5
Bryant Heater.....	128	Made-Rite Furnace Pipe & Fitting Co.....	173	Tennessee Coal, Iron & R. R. Co. 40, 53 & 139	
Buffalo Forge Co.....	121	Maid-O'Mist, Inc.....	58	Thatcher Furnace Co.....	31
Calculator Specialties Co.....	191	Maplewood Machinery Co.....	188	Thor Metal Prod. Co.....	189
Carnegie-Illinois Steel Corp.....	30, 53 & 138	Marshalltown Mfg. Co.....	*	Thor Tool & Die Co.....	186
Central-West Machinery Co., Inc.....	191	Master Products Co.....	185	Tjernlund Mfg. Co.....	145
Century Engineering Corp.....	111	Mayflower Air Conditioners, Inc.....	*	Trade Winds Motor Fans, Inc.....	*
Certified Furnace Co.....	172	McDonnell & Miller, Inc.....	*	Triangle Mfg. Co.....	*
Char-Gale Mfg. Co.....	*	McLarty Systems.....	162	Turner Brass Works.....	169
Chase Brass & Copper Co.....	159	Mercold Corp., Inc.....	185	Tuttle & Bailey, Inc.....	13
Chevrolet Motor Div., General Motors Corp.....	129	Meyer & Bro. Co., F.....	150	Twin City Gas Specialty Co.....	132
Chicago Metal Mfg. Co.....	177	Meyer Furnace Co.....	7	Union Mfg. Co.....	178
Cincinnati Elbow Co., The.....	175	Midco Register Corp.....	187	Uno Ventilating Co.....	179
Clarage Fan Co.....	131	Miller & Doing.....	188	U. S. Machine Corp.....	*
Clayton & Lambert Mfg. Co.....	114	Milton Equipment Co.....	187	United States Register Co.....	40
Clean Sweep Co., The.....	*	Minneapolis-Honeywell Regulator Co.....		United States Steel Corp.....	30, 53 & 138
Cleveland Humidifier Co.....	151	16 & 17 & Inside Back Cover		United States Steel Export Co.....	30, 53 & 138
Climatemaker Slide Rule Service.....	190	Morrison Products, Inc.....	106	United States Steel Supply Co.....	30, 53 & 138
Columbia Steel Co.....	30, 53 & 138	Mt. Vernon Furnace & Mfg. Co.....	188	Utility Appliance Corp.....	*
Conco Engineering Works.....	*	Mueller Furnace Co., L. J.....	39 & 55	Van Packer Corp.....	182
Condensation Engineering Corp.....	8	National Air Conditioning, Inc.....	*	Viking Manufacturing Corp., The.....	56
Connor Engr. Co., W. B.....	163	National Engr. & Mfg. Co.....	173	Ward Machinery Co.....	184
Consolidated Industries, Inc.....	115	National Heater Co.....	160	Washington Steel Corp.....	*
Corlett-Turner Co.....	*	National Lock Company.....	155	Weirton Steel Co.....	35
Cotta Transmission Corp.....	177	National Metal Fabricators.....	176	Western Engg. Co.....	178
Crescent Tool Co.....	48	National Super Service Co.....	188	Wheeling Corrugating Co.....	*
Crise Mfg. Co.....	161	Niagara Machine & Tool Works.....	36	White-Rodgers Elec. Co.....	*
Dahlstrom Machine Works.....	181	Norman Products Co.....	165	Whiteley Bearing Corp.....	*
Damascus Steel Products Corp.....	189	Northwestern Stove Repair Co.....	168	Whitney Mfg. Co., W. A.....	180
Delco Appliance Div., General Motors Corp.....	*	Nu-Way Corp.....	10	Whitney Metal Tool Co.....	175
Delco Products Div., General Motors Corp.....	*	Oddyke Inc., Benjamin P.....	164	Wilhelmsen Sheet Metal Works.....	189
Delta Manufacturing Div., Rockwell Mfg. Co.....	*	Ohio Valley Hardware & Roofing Co.....	148	Williams Oil-O-Matic Division	
Demuth & Sons, Inc., Charles.....	184	Olsen Mfg. Co., C. A.....	22	Eureka Williams Corp.....	27
Des Moines Stove Repair Co.....	177	Orama Stove Repair Works.....	182	Williams-Wallace Co.....	167
Detroit Air Filter Co.....	*	Oran Company, Inc.....	188	Williamson Heater Co.....	*
Detroit Lubricator Co.....	41	Owens-Corning Fiberglas Corp.....	*	Wilson & Co., Inc., Grant.....	3
Dieckman Co., Ferdinand.....	166	Packard Elec. Div., General Motors Corp.....	*	Wilson, K. R.....	125 & 136
Doyle Vacuum Cleaner Co.....	168 & 191	Palmer Mfg. Co.....	171	Wise Furnace Co.....	119
Dravo Corp.....	29	Parker-Kalon Corp.....	189	Wiss & Sons Co., J.....	26
Dreis & Krump Mfg. Co.....	186	Patten Co., J. V.....	12	Wodack Electric Tool Co.....	191
Dresser Industries (See Bryant Heater Co.)	*	Peck, Stow & Wilcox Co.....	153	Wolff & Co., Benjamin.....	11
Elgo Shutter & Mfg. Co.....	189	Peerless Elec. Co.....	155	Wysong & Miles Co.....	42
Empire Ventilation Equipment Co.....	190	Peerless Foundry Co.....	174	XXth Century Htg. & Vent. Co.....	*
Enderle Inc., Ltd., Frank X.....	186			Youngstown Furnace Co.....	179
Zink Co., John.....				Zink Co., John.....	154

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.



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COMFORT *Chronotherm*

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Here's the "R-P Secret" that many dealers already know. When you replace an R-P Fiber Self-Seal Air Filter, you need ONLY the replacement pad—and heavy wire frame or grid can be unhooked and a new pad inserted. You can make this change in your shop, delivering the complete filters to your customers. In the face of higher labor, material and overhead costs you profit by greatly increased savings on R-P Air Filters.

**This extra profit opportunity is
possible ONLY with **RP** Air Filters!**

Just be sure all your customers
USE **RP** Fiber Self-Seal Air Filters
That's easy.

The R-P Fiber Self-Seal Filter is standard on many furnaces and air conditioning systems. But even if your customer is now using others, you can readily show him how and why the R-P Self-Seal catches and holds more dirt, delivers cleaner air longer—and SAVES ON REPLACEMENT COSTS! You can build a long list of enthusiastic R-P users by easily proving R-P superiority, and this means big replacement profits!

Get the whole story now! Write for illustrated folder. It's FREE. Build your own BIG business on R-P Fiber Self-Seal Air Filter replacements.

RESEARCH PRODUCTS CORPORATION

Dept. A, Madison 10, Wisconsin
CANADIAN REPRESENTATIVE—DELHI INDUSTRIES, DELHI, ONTARIO



FILTERS . . . for FINER LIVING

Chosen As Standard Equipment by Leading Manufacturers

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Page 82

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